GOVERNMENTAL INDEMNITY AND REACTOR SAFETY

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HEARINGS

BEFORE THE

JOINT COMMITTEE ON ATOMIC ENERGY CONGRESS OF THE UNITED STATES

EIGHTY-FIFTH CONGRESS

FIRST SESSION

ON

GOVERNMENTAL INDEMNITY AND REACTOR SAFETY

MARCH 25, 26, AND 27, 1957

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GOVERNMENTAL INDEMNITY AND REACTOR SAFETY

MONDAY, MARCH 25, 1957

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
Washington, D. C.

The committee met, pursuant to notice, at 10 a. m., in room 362, Old House Office Building, Representative Carl T. Durham, of North Carolina (chairman of the committee) presiding.

Present: Representatives Durham, Holifield, Price, Kilday, Cole, Van Zandt, and Jenkins; Senator Anderson.

Also present: James T. Ramey, executive director; George E. Norris, Jr., committee counsel, and George E. Brown, Jr., David R. Toll, Hal Hollister, professional members of the staff.

The CHAIRMAN. The committee will be in order.

This is the first day of public hearings by the Joint Committee on Atomic Energy on proposed legislation to provide governmental indemnity against reactor hazards. Specifically, the committee will consider H. R. 1981, introduced by Representative Price, and S. 715, introduced by Senator Anderson. These bills are identical with the committee bill reported out in the last session of Congress, with the addition of some minor changes which were adopted by the committee as an amendment to the original committee bill.

Extensive hearings were held in the last session on this proposed legislation, during which much of the basic ground was covered. I believe the most productive way to proceed in the current hearings is to avoid repetition of the matters which were adequately covered in the previous hearings and confine the discussion to changes in the proposed legislation which are considered necessary. In addition, the committee would like to receive information on matters which were inadequately touched upon in the last session, or were not covered at all.

In particular, the committee believes it important to develop information on private insurance rates and the type of coverage which will be available to various groups such as industry, educational institutions, and nonprofit research organizations. The committee is also looking forward to developing more definitive information on the probabilities of reactor accidents and possible extent of damage. I am glad to report, in this connection, that the committee has received over the weekend a comprehensive study on this matter which it had requested from the Atomic Energy Commission last summer.

I might emphasize, at this point, that the chief reason the committee asked the Commission to make this study was to assist in setting the whole matter in better perspective. The committee has been con-

sciously aware of the concern expressed by some of our citizens regarding the possible dangers involved in the operation of nuclear powerplants near some of our major cities. It was the view of some of the members that some of these potential dangers have tended to be overstated, and for this reason the committee felt it desirable to request last year that a comprehensive study be made by experts in the field to provide a firmer basis for our assumptions. Although I have not had time as yet to read the report in detail, I have gathered from quick perusal of its contents that the great majority of expert opinion feels that the chances of a major accident in nuclear powerplants are extremely remote. This is indeed encouraging news, as we are about to launch on a new era of nuclear-power generation.

Closely allied to this problem is the question of public availability of reactor-safety reports and the matter of how much or what kind of research work is being done to minimize chances of accident. These are both matters which deserve major attention and ones which I hope will receive considerable discussion during the course of the hearings.

Today we are starting off the hearings with a presentation by the Atomic Energy Commission. Industrial and other witnesses will follow, beginning tomorrow and extending through Thursday morning.

At this point I would like to insert in the record the committee's letters of March 12 and 20 to the Commission regarding the Commission's presentation at the hearings, a copy of the committee's announcement of the hearings, and a copy of S. 715 (H. R. 1981) as reported out by the committee last session, including the committee amendments. I would also like to insert a copy of S. 1684 (H. R. 6604) regarding the Advisory Committee on Reactor Safeguards, a copy of the statement made by Senator Anderson, and a letter from the executive director of the committee to witnesses requesting their comments on S. 1684.

(The information referred to follows:)

[No. 75, March 12, 1957, for immediate release]

From the Office of the Joint Committee on Atomic Energy.

The Joint Committee plans to hold public hearings the week of March 25 on proposed legislation providing for governmental indemnity against reactor hazards, it was announced today by the Committee Chairman Carl T. Durham, Democrat, of North Carolina. The committee is inviting representatives of the insurance industry, the plant operators, equipment manufacturers, and other interested organizations and persons to present their views on the proposed legislation and related matters.

In announcing the scheduled hearings, Representative Durham stated:

"Last session, the Joint Committee held extensive hearings on the proposed indemnity legislation and reported out a committee bill after lengthy discussion. I think the most productive approach this session would be to avoid discussing matters already covered adequately in previous hearings. Thus, we will try to confine discussion to changes in the proposed legislation which people believe are necessary, and to develop information not available during the past hearings.

"In the latter connection, the committee would like to receive information regarding private insurance rates and coverage on reactor projects which will be available to American industry, educational institutions, and research organizations. The committee also wishes to receive more definitive information on the probabilities of reactor accidents and possible extent of damage, including a report on this subject requested from the Commission on July 6,

1956. Other matters relating to research on reactor hazards and the question of public availability of reactor-safety reports will be considered."

It is anticipated that the Atomic Energy Commission will lead off the hearings and that industrial and other witnesses will follow on successive days. The hearings should be about a week in duration, depending upon the number of witnesses who wish to testify.

The question of radiation injuries to workers involving workmen's compensation, and the problem of radioactive fallout, will be the subject of separate hearings by the committee, probably the first part of May.

In view of the committee's heavy schedule of hearings, it is hoped that as many as possible of those who wish to testify at the indemnity hearings will submit statements for the record, and that only those who believe it necessary to appear personally will do so. Further information may be obtained by contacting the committee staff in room F–88, the Capitol.

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
Washington, D. C., March 12, 1957.

Mr. LEWIS L. STRAUSS,
Chairman, Atomic Energy Commission,
Washington, D. C.

DEAR MR. STRAUSS: The Joint Committee plans to hold public hearings beginning March 25 on proposed legislation providing for governmental indemnity against reactor hazards. Representatives of the insurance industry, the plant operators, equipment manufacturers, and other interested organizations and persons are being invited to present their views on the proposed legislation and related matters. A copy of our press announcement is attached.

It would be appreciated if you would make the necessary arrangements to have representatives of the Commission lead off the testimony on Monday, March 25. Industrial and other witnesses will follow on successive days.

I anticipate that the hearings will be about a week in duration, depending upon the number of witnesses who wish to testify and on the time required in questions and discussion.

With respect to our request for a study on potential damage which could be caused by reactor accidents, we have noted that you indicate in your March 1 letter that it will not be possible to have the report ready by March 15, but that you will make every effort to have it ready by the earliest possible date thereafter. It would be extremely desirable, if not a necessity, that we have the report by March 22 in order to permit staff review over the weekend prior to the March 25 hearings.[1]

I think it would be helpful, as in the case of 202 hearings, if our staff could get together soon to discuss arrangements for the hearings and the general scope of the Commission's testimony.

Sincerely yours,

CARL T. DURHAM, *Chairman.*

[S. 715, 85th Cong., 1st sess.]

A BILL To amend the Atomic Energy Act of 1954, as amended, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 2 of the Atomic Energy Act of 1954, as amended, is amended by adding a new subsection to read as follows:

"i. In order to protect the public and to encourage the development of the atomic energy industry, in the interest of the general welfare and of the common defense and security, the United States may make funds available for a portion of the damages suffered by the public from nuclear incidents, and may limit the liability of those persons liable for such losses."

SEC. 2. Subsection 53 e. (8) of the Atomic Energy Act of 1954, as amended, is amended to read as follows:

"(8) except to this extent that the indemnification and limitation of liability provisions of section 170 apply, the licensee will hold the United States

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[1] The Joint Committee is planning to reproduce the Report as a Committee Print.

and the Commission harmless from any damages resulting from the use or possession of special nuclear material by the licensee."

SEC. 3. Section 11 of the Atomic Energy Act of 1954, as amended, is amended by adding thereto the following new subsections, and redesignating the other subsections accordingly:

"j. The term 'financial protection' means the ability to respond in damages for public liability."

"n. The term 'licensed activity' means an activity licensed pursuant to this Act."

"u. The term 'public liability' means any legal liability arising out of or resulting from a nuclear incident, except claims under State or Federal Workmen's Compensation Acts of employees of persons indemnified who are employed in connection with the activity where the nuclear incident occurs, and except claims for damage to property of persons indemnified which is located at the site of and used in connection with the activity where the nuclear incident occurs."

"o. The term 'nuclear incident' means any occurrence within the United States causing bodily injury or death, or loss of or damage to property, or for loss of use of property arising out of or resulting from the radioactive, toxic, explosive, or other hazardous properties of source, special nuclear, or byproduct material."

"r. The term 'person indemnified' means the person with whom an indemnity agreement is executed and any other person who may be liable."

SEC. 4. The Atomic Energy Act of 1954, as amended, is amended by adding thereto a new section, with the appropriate amendment to the table of contents:

"SEC. 170. INDEMNIFICATION AND LIMITATION OF LIABILITY.—

"a. Each license issued under section 103 or 104 and each construction permit issued under section 185 shall, and each license issued under sections 53, 63, or 81 may, have as a condition of the license a requirement that the licensee have financial protection of such type and in such amounts as the Commission shall require in accordance with subsection 170 b. to cover public liability claims. Such financial protection may include private insurance, private contractual indemnities, self insurance, other proof of financial responsibility, or a combination of such measures. Whenever such financial protection is required, it shall be a further condition of the license that the licensee execute and maintain an indemnification agreement in accordance with subsection 170 c. The Commission may require, as a further condition of issuing a license, that an applicant waive any immunity from public liability conferred by Federal or State law.

"b. The amount of financial protection required shall not exceed the amount of liability insurance available from private sources. The Commission shall establish criteria in writing for the determination of the amount of financial protection to be required, taking into consideration such factors as the following: (1) the cost and terms of private insurance, (2) the type, size, and location of the licensed activity and other factors pertaining to hazard, and (3) the nature and purpose of the licensed activity.

"c. The Commission shall, with respect to licenses issued between August 30, 1954, and August 1, 1966, for which it requires financial protection, agree to indemnify and hold harmless the licensee and other persons indemnified (other than a Government agency), as their interest may appear, from public liability arising from nuclear incidents which is in excess of the amount of financial protection required in the amount of $500,000,000 in the aggregate for all persons indemnified in connection with each nuclear incident. Such a contract of indemnification shall cover public liability arising out of or in connection with the licensed activity.

"d. In addition to any other authority the Commission may have, the Commission is authorized until August 1, 1966, to enter into agreements of indemnification with its contractors for the construction or operation of production or utilization facilities or research and development plants for the benefit of the United States. In such agreements of indemnification the Commission may require its contractor to provide financial protection of such a type and in such amounts as the Commission shall determine to be appropriate to cover public liability arising out of or in connection with the contractual activity, and shall indemnify the persons indemnified against such claims above the amount of the financial protection required, in the amount of $500,000,000 in the aggregate for all persons indemnified in connection with such contract and for each nuclear incident. The provisions

of this subsection may be applicable to lump sum as well as cost type contracts and to contracts and projects, financed in whole or in part by the Commission.

"e. The aggregate liability for a single nuclear incident of persons indemnified shall not exceed the sum of $500,000,000 together with the amount of financial protection required and any other sums which may be made available by the Congress as additional indemnification. The Commission or any person indemnified may apply to the appropriate district court of the United States having venue in bankruptcy matters over the location of the nuclear incident, and upon a showing that the public liability from a single nuclear incident will probably exceed the limit of liability imposed by this section shall be entitled to such orders as may be appropriate for enforcement of the provisions of this section, including an order limiting the liability of the persons indemnified, orders staying the payment of claims and the execution of court judgments, orders apportioning the payments to be made to claimants, orders permitting partial payments to be made before final determination of the total claims, and an order setting aside a part of the funds available for possible latent injuries not discovered until a later time.

"f. The Commission is authorized to collect a fee from all persons with whom an indemnification agreement is executed under this section. This fee shall be $30 per year per thousand kilowatts of thermal energy capacity for facilities licensed under section 103. For facilities licensed under section 104, and for construction permits under section 185, the Commission is authorized to reduce the fee set forth above. The Commission shall establish criteria in writing for determination of the fee for facilities licensed under section 104, taking into consideration such factors as (1) the type, size, and location of facility involved, and other factors pertaining to hazard, and (2) the nature and purpose of the facility. For other licenses, the Commission shall collect such nominal fees as it deems appropriate.

"g. In administering the provisions of this section, the Commission shall use, to the maximum extent practicable, the facilities and services of private insurance companies and insurance adjustment organizations, and the Commission may contract to pay a reasonable compensation for such services. Any contract made under the provisions of this subsection may be made without regard to the provisions of section 3709 of the Revised Statutes, as amended, upon a showing by the Commission that advertising is not reasonably practicable, and advance payments may be made.

"h. The agreement of indemnification may contain such terms as the Commission deems appropriate to carry out the purposes of this section. Such agreement shall provide that, when the Commission makes a determination that the United States will probably be required to make indemnity payments under this section, the Commission shall collaborate with any person indemnified and may approve the payment of any claim under the agreement of indemnification, appear through the Attorney General on behalf of the person indemnified, take charge of such action, and settle or defend any such action. The Commission shall have final authority on behalf of the United States to settle or approve the settlement of any such claim on a fair and reasonable basis with due regard for the purposes of this Act. Such settlement may include reasonable expenses in connection with the claim incurred by the person indemnified.

"i. After any nuclear incident which will probably require payments by the United States under this section, the Commission shall make a survey of the causes and extent of damage which shall forthwith be reported to the Joint Committee. Except as forbidden by the provisions of chapter 12 of this Act or any other law or Executive order, such reports shall also be made available to the public, to the parties involved and to the courts. The Commission shall report to the Joint Committee by April 1, 1957, and every three years thereafter on the operations under this section.

"j. In administering the provisions of this section, the Commission may make contracts in advance of appropriations and incur obligations without regard to section 3679 of the Revised Statutes, as amended. Any appropriations presently or hereafter made available to the Commission shall be available for the payment of obligations under indemnity agreements entered into under this section. There are hereby authorized to be appropriated $50 million to be available for emergency use by the Commission upon certification by the Commission to the Secretary of the Treasury that a nuclear incident has occurred which may require payment by the Commission out of these funds pursuant to the provisions of this section."

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
March 20, 1957.

Mr. K. E. FIELDS,
General Manager, United States Atomic Energy Commission,
Washington, D. C.

DEAR MR. FIELDS: This will confirm discussions at the meeting in which Messrs. Price, Mitchell, and LaPlante participated with representatives of the staff of the Joint Committee on March 19, concerning the arrangements and scope of the Commission's presentation at the indemnity hearings.

Mr. Mitchell indicated that the Commission intended to present its views on the Anderson-Price bills, together with some narrative discussions on the probabilities of reactor accidents and extent of possible damage. He further indicated that the Commission testimony would include comments on means of handling indemnity or insurance for American equipment firms who manufacture reactors for operation abroad in response to our letter of March 7, 1957.

Mr. Price indicated that it was not clear whether the Commission would be able to submit its report on the probabilities of reactor hazards and extent of damage by Friday, March 22, as requested in our letter of March 12.

I indicated that in line with our letter, it would be helpful if the Commission was prepared to testify on the following additional matters:

1. The rates, terms, and coverage of private insurance for reactor hazards.
2. A description of AEC research projects on reactor hazards.
3. Comments on the desirability of the public availability of Reactor Safeguard Committee reports on power reactors.
4. Information and comments on the status of AEC regulations or policies which would establish criteria or factors as to the location and other safety arrangements with respect to reactor hazards.

There undoubtedly will be other matters relating to the indemnity problem that various members of the committee will want to raise during the Commission presentation on Monday, March 25.

Sincerely yours,

JAMES T. RAMEY, *Executive Director.*

[S. 1684, 85th Cong., 1st sess.]

A BILL To amend the Atomic Energy Act of 1954, as amended, with respect to procedures on applications for facility licenses, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Atomic Energy Act of 1954, as amended, is amended by adding thereto a new section, making the appropriate amendment to the Table of Contents, as follows:

"SEC. 29. COMMITTEE ON REACTOR SAFEGUARDS.—There is hereby established a Committee on Reactor Safeguards consisting of a maximum of fifteen members appointed by the Commission for terms of four years each. The Committee shall review safety studies and facility license applications referred to it and shall make reports thereon, shall advise the Commission with regard to the hazards of proposed or existing reactor facilities and the adequacy of proposed reactor safety standards, and shall perform such other duties as the Commission may request. One member shall be designated by the Committee as its Chairman. The members of the Committee shall receive a per diem compensation for each day spent in meetings or conferences, and all members shall receive their necessary traveling or other expenses while engaged in the work of the Committee. The provisions of section 163 shall be applicable to the Committee."

SEC. 2. The Atomic Energy Act of 1954, as amended, is amended by adding thereto a new subsection 182 d., as follows:

"The Committee on Reactor Safeguards shall review each application under section 103 or 104 b. for a license for a facility, any application under section 104 c. for a testing facility, and any application under section 104 a. or c. specifically referred to it by the Commission, and shall submit a report thereon, which shall be made part of the record of the application and available to the public, except to the extent that security classification prevents disclosure."

SEC. 3. The Atomic Energy Act of 1954, as amended, is amended by adding the following sentence at the end of section 189 a.: "The Commission shall hold a hearing after thirty days notice and publication once in the Federal Register

on each application under section 103 and 104 b. for a license for a facility, and on any application under section 104 c. for a license for a testing facility."

STATEMENT BY SENATOR ANDERSON, IN THE UNITED STATES SENATE, MARCH 21, 1957, ON BILL TO ESTABLISH REACTOR SAFEGUARDS COMMITTEE AND REQUIRE PUBLIC REPORTS AND PUBLIC HEARINGS

It is my privilege to introduce a bill to amend the Atomic Energy Act of 1954 to require that the AEC shall follow certain important procedures in connection with applications for construction permits or licenses to operate nuclear reactors. These procedures are intended to help increase public knowledge of reactor safety problems and control, and also to help assure fair and impartial administrative actions on applications.

Section 1 of the bill formally establishes a Committee on Reactor Safeguards to be named by the Atomic Energy Commission. This committee is now in existence as an advisory group to the AEC, and is composed of a number of outstanding experts and scientists. It is hoped that we will be able to obtain additional public benefits from their valued counsel and advice. Section 2 therefore requires that the Reactor Safeguards Committee shall review certain reactor applications and that its reports shall be made available to the public except to the extent that security classification prevents disclosure. Section 3 of the bill then requires that the Atomic Energy Commission shall hold a hearing, after 30 days' notice, on applications for permits or licenses for construction and operation of certain types of reactors.

The bill proposes to require public reports by the Reactor Safeguards Committee as well as public hearings on applications to construct and operate most power and testing reactors, but it leaves to the AEC flexibility as to procedures on applications to construct and operate research reactors.

Last summer I directed the staff of the Joint Committee on Atomic Energy to undertake a study of AEC procedures and organization in the licensing of reactor facilities. This bill represents my own views as to what is needed at this time insofar as new licensing procedures are concerned. I am still studying the organizational questions and I hope to introduce another bill on this subject sometime this session.

The AEC has had an excellent safety record in the past, but I believe that we should take every possible step to protect the health and safety of the public in the future as more reactors are constructed and operated throughout our country. We should strive to prevent through every possible means the occurrence of an atomic catastrophe which could cause widespread damage and set the atomic-energy program back many years. We should establish procedures which are open to all, with a maximum of information disseminated as to the hazards and safety of each proposed design of a reactor, and as to the administrative considerations and actions taken on each application. The public has a substantial investment in the atomic-energy program and has a right to know and analyze the steps being followed by administrative officials.

When the Atomic Energy Act was amended 3 years ago, I made the following statement on the floor of the Senate on July 14, 1954, expressing my opinion as to the advisability of public hearings on reactor license applications:

"* * * But because I feel so strongly that nuclear energy is probably the most important thing we are dealing with in our industrial life today, I wish to be sure that the Commission has to do its business out of doors, so to speak, where everyone can see it.

"Although I have no doubt about the ability and integrity of the members of the Commission, I simply wish to be sure they have to move where everyone can see every step they take; and if they are to grant a license in this very important field, where monopoly could so easily be possible, I think a hearing should be required and a formal record should be made regarding all aspects, including the public aspects."

Almost 3 years have now passed and I believe my words of 1954 are still applicable. Perhaps I should reiterate again, however, that this bill is not intended as a criticism of the Commission staff, nor of course, of the members of the Advisory Committee on Reactor Safeguards. The Advisory Committee, so far as I know, is a group which holds and deserves public respect, and its advice is eagerly sought by many people, including members of the insurance industry who are becoming aware of atomic energy hazards problems. Similarly, the AEC staff has worked hard and well with industrial applicants, has cut redtape and

administrative delay, and is a conscientious and technically able group. I mean no reflection on their abilities or integrities by this bill, and I hope, that I am understood on that point. I believe that the increased workload would not handicap the effectiveness of either the Advisory Committee or the AEC staff, and I further believe the public importance of these more formalized procedures warrants their adoption. Of course, we shall welcome comments on the bill.

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
March 22, 1957.

DEAR MR. _____: Enclosed is a copy of S. 1684, 85th Congress, 1st session, introduced by Senator Anderson yesterday, and also a copy of a statement by Senator Anderson at the time he introduced the bill, as copied from page 3616 of the Congressional Record of March 21, 1957.

Senator Anderson has asked the staff to distribute the bill and statement to you. He indicated that he would appreciate any comments which you might have on the bill during your appearance before the joint committee next week.

Sincerely yours,

JAMES T. RAMEY, *Executive Director.*

The CHAIRMAN. Mr. Strauss, I am glad to welcome you, the other members of the Commission, and your principal advisers, back to the committee. This indemnity bill is a matter of great interest to all of us, and we look forward to receiving your views on it. It is understood that your statement was revised over the weekend, so the members and staff have not had an opportunity to analyze it in advance.

Would you proceed, please?

STATEMENTS OF LEWIS L. STRAUSS, CHAIRMAN; DR. W. F. LIBBY, COMMISSIONER; HAROLD S. VANCE, COMMISSIONER; THOMAS E. MURRAY, COMMISSIONER; K. E. FIELDS, GENERAL MANAGER; WILLIAM MITCHELL, GENERAL COUNSEL; HAROLD L. PRICE, DIRECTOR, DIVISION OF CIVILIAN APPLICATIONS; AND W. KENNETH DAVIS, DIRECTOR, DIVISION OF REACTOR DEVELOPMENT, UNITED STATES ATOMIC ENERGY COMMISSION

Mr. STRAUSS. Thank you. Mr. Chairman and members of the committee, we are pleased to be here this morning, because we hope that your committee is nearing the solution of one of our principal problems involved in the rapid development of nuclear power in the United States.

The bills which you have under consideration—that is to say, S. 715 and H. R. 1981—offer a practical approach to the necessity of providing adequate protection against liability arising from atomic hazards, as well as a sound basis for compensating the public for any possible injury or damage arising from such hazards.

The committee bill reflects the energy, skill, and long-range viewpoint that have characterized the efforts of your committee, the atomic-energy industry, and the insurance industry to reach a workable solution to what admittedly is a difficult matter. The Commission has, of course, given long and detailed study to the problem.

The Commission shares the hope of the committee and industry that congressional action on the legislation may be completed early in this session of the Congress, so that the United States may move forward, at an accelerated pace, toward our goal of economical, com-

petitive, and safe nuclear power. No single thing that your committee might do could contribute so greatly to the acceleration of nuclear-power development in the United States as would early and favorable action on this subject.

As I have said, the Commission has been studying the indemnity problem continuously since the adjustment of the last session of Congress. It has considered the constructive opinions of representatives of the atomic-energy industry and the substantial progress made by the insurance industry in providing coverage against atomic hazards.

Also, the Commission has studied the two identical bills introduced by members of your committee—and, for convenience, I shall refer to the Senate version, S. 715—as alternative means of providing supplemental liability protection by the Government. You will recall that the Commission approach to the problem embodied in H. R. 11242, of the last session of Congress, differed somewhat from the provisions of the present committee bill, which is substantially the same as the bill reported out by the committee last year.

The Commission testified that if Congress decided that the type of program incorporated in S. 3928, which was essentially that reported by the committee, was preferable to that proposed by the Commission, we would be content, since we believed that such a program was a workable one.

From the testimony in last year's hearing, it appears that both the atomic-energy industry and the insurance companies would prefer the type of legislation provided in S. 715.

The advocacy of the atomic-energy industry for protection against liability certainly has not lessened since last year. Indications supporting this conclusion can be found in the statements made by members of the industry at a meeting of the Atomic Industrial Forum on this subject on January 22, by the forum's report on financial protection against atomic hazards, by a poll which indicated that lack of adequate protection against liability was a major obstacle to atomic-energy development, and by the consensus expressed at the recent meeting of the American Management Association.

The Commission's continuing discussions with the insurance organizations do not indicate any significant change in the private resources available to provide for coverage by individual companies. We understand that these organizations are now prepared to issue policies. The amounts of coverage available are approximately the same as the estimates of last year—in excess of $50 million per policy for property insurance on nuclear-energy facilities and a similar amount for public liability.

However, those who are engaged in or who are considering activities involving use of reactors, and the supply of components and services for them, know that additional protection against liability in excess of the available insurance coverage is necessary.

The approach embodied in the committee bill, S. 715, has merit particularly with respect to elimination of possible gaps in the availability of compensation to the public for injury and damage. The Commission wishes to propose some changes and clarification in language which it considers important and which it believes will improve certain provisions of the proposed legislation.

Basically, the Commission believes that the approach presented in S. 715 is practical. It also believes that consideration of the Commission's recommendations with respect to S. 715 would not delay unduly the final perfecting of the legislation.

As part of the Commission's testimony, we are submitting for the record a study of the possible consequences in terms of injury to persons and damage to property if certain hypothetical accidents should occur in a typical large nuclear-power reactor.

A large team of individuals prominent in the sciences and engineering specialists participated in this study.

I am happy to report that the experts all agree that the chances that major accidents might occur are exceedingly small.

This study is a part of the Commission's continuing effort on a broad front to understand and resolve this problem of possible reactor hazards so that we may proceed with an expanding atomic-energy industry with full confidence that there will be few reactor accidents and that such as do occur would have only minor consequences. This effort and the work of translating the results into affirmative, concrete safeguards for protection of the public is, of course, our continuing responsibilty.

Since the beginning of the reactor program the experts and the Congress and the public and the Commission have all been concerned with the possible causes and the possible magnitude of damage from reactor runaways, and with means of prevention. The subject commanded four sessions of the International Conference on the Peaceful Uses of Atomic Energy in Geneva 18 months ago, which, as you will recall, we initiated. In May of last year, Dr. Libby presented to your committee some estimates of the possible extent of harm and damage should a major accident occur.

The current study has taken the form in which it is now presented to you as a means of responding to the committee's specific request of last July 6. To produce such a study, it was necessary to stretch possibility far out toward its extreme limits. Some of the worst possible combinations of circumstances that might conceivably occur were conjoined in the hypotheses in order that we might assess their consequences. The study, therefore, ought to be regarded as an estimation of the consequences of unlikely, though imaginable, combinations of failure and error and weather conditions; it is not in any sense a prediction of any future condition.

It has been a difficult study to make. Fortunately, there has been little reactor accident experience upon which to base estimates. Nuclear reactors have been operated in the United States since December 2, 1942, with a safety record better than that of other industry. More than 100 reactor years of regular operating experience have been accumulated, including experience with reactors of high power and large inventories of fission products, without a single personal injury and no significant deposition of radioactivity outside of the plant area. There have been a few accidents with research reactor installations as contrasted with the perfect record of safety of the regularly operating reactors. But even these accidents with research and experimental reactors did not affect the public.

This record which shows that safe operation can be achieved is due to skillful design, careful construction, and competent operation.

Looking to the future, the principle on which we have based our criteria for licensing nuclear power reactors, is that we will require multiple lines of defense against accidents which might release fission products from the facility. Only by means of highly unlikely combinations of mechanical and human failures could such releases occur. Furthermore, the Government and industry are investing heavily in studies to learn more about the principles of safe reactor design and operation.

Establishing hypothetical circumstances under which harm and damage could occur, and arriving at estimations of the theoretical extent of the consequences, proved a complex task.

To make the study, we enlisted the services of a group of scientists and engineers of the Brookhaven National Laboratory and of another group of experts to serve as a steering committee. Through recent months these men have met with many additional expert advisers to test out judgments on the estimate arrived at.

We are not aware of such a study having been undertaken for any other industry. I venture to say that if a similar study were to be made for certain other industries, with the same free rein to imagination, we might be startled to learn what the consequences of conceivable major catastrophic accidents in those other industries could be. The actual safety experience of these industries stands on the record in marked contrast.

Remembering that this study analyzes theoretical consequences and possibilities of reactor accidents, we might note the judgments presented are, (1) possible consequences of major accidents and, (2) the probability of occurrences of any major reactor accident.

The portion of the study dealing with consequence of theoretical accidents started with the assumption of a typical power reactor of 500,000 kilowatts thermal power in a characteristic power-reactor location. Accidents were postulated to occur not immediately but after 180 days of operation, when essentially full fission product inventories had been built up.

Three types of accidents which could cause serious public damages were assumed. Pessimistic (higher hazard) values were chosen for numerical estimates of many of the uncertain factors influencing the final magnitude of the estimated damages. It is believed that these theoretical estimates are greater than the damages that would occur even in the unlikely event of such accidents.

For the 3 types of assumed accidents, the theoretical estimates indicated that personal damage might range from a lower limit of none injured or killed to an upper limit, in the worst case, of about 3,400 killed and about 43,000 injured.

If there were 100 large power reactors operating in the United States, the most pessimistic of the probabilities quoted above lead to the estimate that there would be less than 1 chance in 50 million of getting killed in any year in a reactor accident. By comparison, there is presently about 1 chance in 5,000 of getting killed in any year by an automobile accident.

Hypothetical property damages range from a lower limit of about one-half million dollars to an upper limit in the worst imaginable case of about $7 billion. This latter figure is largely due to assumed contamination of land with fission products.

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Now let us turn to the judgment of experts on the probability of accidents. Some experts held that numerical estimates of a quantity so vague and uncertain as the likelihood of occurrence of major reactor accidents have no meaning. They declined to express their feeling about this probability in numbers. Others, though admitting similar uncertainty, nevertheless ventured to express their opinions in numerical terms. Estimations so expressed of the probability of major reactor accidents having major effect on the public ranged from 1 chance in 100,000 per year to 1 in a billion per year for such accidents for each large reactor. However, whether numerically expressed or not, there was no disagreement in the opinion that the probability of major reactor accidents is exceedingly low.

It occurs to me that we might here state some of the reasons for this belief.

First, industry and Government are determined to maintain safety and to protect the health and property of the public from nuclear hazards. The Congress has authorized, and the Commission is carrying out a program of close and careful regulation and inspection. Thus, the potential hazard of this industry has been recognized in advance of its development and brought under a strict system of safety control. This has been done before the occurrence of accidents which in other fields have marked the birth of new industries and have subsequently led to adoption of measures for their control after the fact.

Secondly, the challenge of this new and important venture in man's application of the forces of nature has attracted able and energetic men into the wrok of assuring safe design and operation.

In the third place, multimillion dollar efforts in research and development, both public and private, are directed toward identifying and solving safety problems. We know of no other industry where so much effort has been and is being spent on the definition and solution of safety problems.

Fourthly, the cost to the industry and Government of reactor accidents, even of a minor nature, would be very high. Self-interest, therefore, as well as public interest, dictates avoidance of accidents.

To sum up, the report affirms that a major reactor accident is extremely unlikely. As I stated earlier, to reduce the matter of assumed hazards to comparative members, by taking the most pessimistic assumptions used and applying them to a case of 100 power reactors in operation in the United States, the chances of a person being killed in any one year by a reactor accident would be less than 1 in 50 million. By contrast, the present odds of being killed in any one year by an automobile accident in the United States stand at about 1 to 5,000.

For the Atomic Energy Commission, let me say that the report serves to identify areas where continued research and development are needed, and areas where emphasis is needed in the further development of our regulatory program. It gives renewed emphasis to our belief that our research and development and our regulatory program in the nuclear power field must continue with vigor to the end that the conceivable catastrophe shall never happen. We are determined to do what is humanly possible to see that it shall not.

In order that nuclear power development may proceed at the pace that is possible only if American industrial ingenuity and energy are

devoted to its full scale, it is important that indemnity legislation to safeguard against even the small contingency of a reactor accident be passed at this session of the Congress. Public will and public confidence would be strengthen by this protection. Accumulated capital—representing the prudence and the thrift of millions of our fellow citizens of large and small resources—will continue to flow into this new field of human invention and accomplishment.

In the course of time, with the depletion of our other sources of energy, we must in any case rely upon the development of atomic energy. The way to learn to control it is to live with it with care, intelligence, with respect for its dangers, as well as its inevitable usefulness, just as man has learned to live with fire.

Aside from the subject of this legislation to provide indemnity for nuclear incidents occurring in the United States, the committee has also requested that we comment on the problem of products liability of manufacturers of production or utilization facilities or components thereof exported for use in other countries. In particular, we were asked to comment on the resolution of this problem through an international convention, which might include a pooled fund to provide indemnity in such cases. Since the United States will be one of the principal exporting countries, this problem is of particular concern to American industry.

There is some precedent for such an approach as that suggested in maritime law and in the Warsaw Convention dealing with the liability of international civil aviation operations. The principal differences with respect to the nuclear field are perhaps (1) the fixed situs of most nuclear facilities, not obviously nuclear-powered ships, whereas the other examples deal with transportation, (2) the liability in the nuclear field being primarily for injury to the general public or damage to its property rather than for injury to passengers or damage to goods being transported, (3) the remote possibility of very much larger potential damage in the nuclear field, and (4) the lack of accident experience in the nuclear field, compared with sufficient experience in the others to provide some basis for establishing frequency and severity probabilities.

The international liability problem includes many complexities which are not present in the domestic problem. Some of these are:

(1) The extent to which limitation of liability should apply, as compared with indemnification.

(2) The extent to which insurance against this liability can be made available.

(3) The means of building up an indemnity fund, whether by subscription of member countries in some ratio similar to that used in providing capital for the International Bank, or payments based on volume by exporting countries or by importing countries, or some combination of these or other methods.

(4) The size of the fund to be established, and its adequacy for protection of the public.

(5) The organization to administer such a fund and process claims made against it.

(6) Accommodation of such an international convention to the domestic laws of the nations involved. We understand some other nations already have taken steps to limit liability arising from nuclear incidents.

(7) The willingness, for this and other reasons, of at least some of the nations engaged in international trade in nuclear facilities to enter into such convention.

These are probably but a few of the many difficult facets that further study and analysis of this problem would disclose. We believe, however, that the international convention is a promising approach to a resolution of the problem. It will obviously take some time to work out. The Commission plans, therefore, to expedite consideration of it in collaboration with other appropriate agencies.

The committee also noted that another possible solution could be to arrange for indemnities under our bilateral agreements for cooperation. On the basis of our study this far the Commission has reservations regarding the desirability of this approach. It would require a cooperating country, as a condition to receiving the benefits offered by our Atoms for Peace program, to undertake the indemnification of private American capital. Perhaps rather than encouraging the sale of American reactors abroad, such a procedure might have the reverse effect. We are continuing to study this suggestion, however.

Mr. Harold L. Price, Director of the Commission's Division of Civilian Application, will with your permission outline the changes to S. 715 which, in the opinion of the Commission, would make the proposed legislation more consistent with the terms of the proposed liability insurance and provide for better administration.

May Mr. Price present his statement?

The CHAIRMAN. Mr. Price may proceed, and then we will probably like to ask some questions after we hear his testimony.

Senator ANDERSON. He has a prepared statement?

Mr. PRICE. Yes, sir; I do, Senator Anderson.

Senator ANDERSON. You know the rule under the Reorganization Act about submitting it in advance. Have you done that?

Mr. PRICE. It was submitted this morning, sir.

Senator ANDERSON. It is not exactly an answer is it? That is not in conformity with the requirements. I think this is a technical matter and people would like to have had a chance to study it. When did you have it ready?

Mr. PRICE. Sir, I had it ready yesterday, that is, the final revision of it. It was approved by the Commission last week.

Senator ANDERSON. How long have you known that this hearing was going to be held?

Mr. PRICE. We have known about 2 weeks, I believe, Senator Anderson.

Senator ANDERSON. Longer than that; nearly a month.

Mr. PRICE. It could be. I have forgotten the date. I would have to check it. I believe it was something like 2 or 3 weeks.

The CHAIRMAN. Try to get them to us hereafter at least 3 or 4 days ahead of time if it is not too much inconvenience and not too much work.

Mr. PRICE. Yes, sir; we tried. We just missed it.

The CHAIRMAN. We would like to read them over before the hearing.

Mr. STRAUSS. I think the blame for this is mine, Mr. Chairman. My statement was introductory to Mr. Price's statement. My statement unfortunately could not be completed until yesterday, because

I was in Bermuda. It is undoubtedly for that reason, and not because of any discourtesy to the committee on Mr. Price's part, that his statement was not submitted earlier.

The CHAIRMAN. Mr. Price, you may proceed.

Mr. PRICE. Mr. Chairman, I merely would propose, with your permission, to outline the revisions which the Commission recommends in S. 715.

(Following is a redraft of S. 715 and H. R. 1981, proposed by the AEC, together with their analysis of the proposed redraft.)

UNITED STATES ATOMIC ENERGY COMMISSION

INDEMNITY LEGISLATION—A PROPOSED REDRAFT OF S. 715 AND H. R. 1981

[Revisions to the Anderson bill (S. 715 and H. R. 1981) are shown by italicizing additions and striking through deletions]

A BILL To amend the Atomic Energy Act of 1954, as amended, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section 2 of the Atomic Energy Act of 1954, as amended, is amended by adding a new subsection to read as follows:

"i. In order to protect the public and to encourage the development of the atomic energy industry, in the interest of the general welfare and of the common ~~o~~defense and security, the United States may make funds available for ~~a portio nf the~~ damages suffered by the public from nuclear incidents, and may limit the liability of those persons liable for such losses."

SEC. 2. Subsection 53e (8) of the Atomic Energy Act of 1954, as amended, is amended to read as follows:

"(8) except to ~~t~~ *the* extent that the indemnification and limitation of liability provisions of section 170 apply, the licensee will hold the United States and the Commission harmless from any damages resulting from the use or possession of special nuclear material by the licensee."

SEC. 3. Section 11 of the Atomic Energy Act of 1954, as amended, is amended by adding thereto the following new subsections, and redesignating the other subsection accordingly:

"j. The term 'financial protection' means the ability to respond in damages *including costs of investigation, defense and settlement of claims* for public liability, *insofar as insurance is available from private sources of the United States market. Such financial protection may include private insurance, private contractual indemnities, self insurance, other proof of financial responsibility, or a combination of such measures.*

"*l. The terms 'indemnity' and 'indemnification' mean obligation to pay on behalf of the persons indemnified all sums which the persons indemnified shall become legally obligated to pay as damages caused by a nuclear incident, including costs of investigation, defense and settlement of claims, and to pay the persons indemnified for damage to any of their property other than that located at the site of and used in connection with the licensed activity where the nuclear incident occurs.*"

"~~n~~. *o.* The term 'licensed activity' means ~~an activity~~ *activities* licensed pursuant to *section 103, 104, or 53, or authorized by a construction permit issued pursuant to section 185, of* this Act."

"~~o~~ *p.* The term 'nuclear incident' means any occurrence within the United States causing bodily injury, *sickness* or *disease, including* death *resulting therefrom, hereinafter called 'bodily injury';* ~~or loss of~~ or ~~damage~~ *physical injury* to *or destruction or radioactive contamination of* property, ~~or~~ *and* ~~for~~ loss of use of property *so injured, destroyed or contaminated, and loss of use of property while evacuated by order of public authority because of possible contamination, hereinafter called 'property damage'* arising out of or resulting from the radioactive, toxic, explosive, or other hazardous properties of source, special nuclear, or byproduct material."

"~~p~~. *s.* The term 'person indemnified' means the person with whom an indemnity agreement is executed and any other person who may be liable.

"~~q~~. *v.* The term 'public liability' means any legal liability arising out of or resulting from a nuclear incident, except claims under State or Federal Workmen's Compensation Acts of employees of persons indemnified. ~~who are em-~~

~~ployed in connection with the activity where the nuclear incident occurs; and except claims for damages to property of persons indemnified which is located at the site of and use in connection with the activity where the nuclear incident occurs.~~"

SEC. 4. The Atomic Energy Act of 1954, as amended, is amended by adding thereto a new section, with the appropriate amendment to the table of contents:

SEC. 170. Indemnification and Limitation of Liability.

"a. *At any time within ten years of the date of enactment of this section* each license, *except those issued for the export of production or utilization facilities under terms of an agreement for cooperation arranged pursuant to section 123, and those issued to an agency of the Federal Government* issued under sections 103 and 104; ~~and~~ each construction permit issued under section 185; ~~shall;~~ and each license issued under section 53, ~~63 or 81~~ *where the licensee is licensed to have in his possession sufficient quantities of materials to, constitute in accordance with criteria which the Commission shall establish in writing, a hazard involving potential widespread bodily injury to others than employees of the licensee or widespread property damage to property not controlled by the licensee from a nuclear incident; and each such license issued between August 30, 1954 and the date of enactment of this section,* ~~may~~ *shall* have as a condition of the license a requirement that the licensee have *and maintain* financial protection of such type and in such amounts as the Commission shall require in accordance with subsection 170b to cover public liability claims. ~~Such financial protection may include private insurance, private contractual indemnities, self insurance, other proof of financial responsibility, or a combination of such measures.~~ Whenever such financial protection is required, it shall be a further condition of the license that the licensee execute and maintain an ~~indemnification~~ agreement *for his indemnification by the Commission* in accordance with subsection 170c. The Commission may require, as a further condition of issuing a license, that an applicant waive any immunity from public liability conferred by Federal or State law.

"b. The amount of financial protection required shall ~~not exceed~~ *be* the amount of liability insurance available from private insurance sources of *the United States market, except that* ~~The~~ *the* Commission ~~shall~~ *may* establish *a lesser amount on the basis of* criteria *set forth* in writing, *which it may from time to time revise,* ~~for the determination of the amount of financial protection to be required,~~ taking into consideration such factors as the following: ~~(1) the cost and terms of private insurance; (2)~~ (*1*) the ~~type,~~ size and location of the licensed activity and other factors pertaining to hazard, and ~~(3)~~ (*2*) the nature and purpose of the licensed activity. *Where the amount of insurance coverage is reduced by reason of losses and expenses incurred and is not automatically reinstated the financial protection maintained by the licensee may be reduced below the amount required for a limited period or periods, at the discretion of the Commission pending reinstatement.*

"c. The Commission shall, with respect to licenses for which it requires financial protection, ~~agree to~~ indemnify and hold harmless the licensee and *any owner, operator, user, manufacturer, designer or builder of any facility or any part thereof to which such license applies, and any supplier of equipment, material or services used by such licensed activity* ~~other persons indemnified, (other than a Government agency)~~ as their interest may appear from public liability arising from nuclear incidents which is in excess of the amount of financial protection required, *provided, that such indemnification shall apply to all claims which may be made for bodily injury or property damage which result from nuclear incidents occurring during the license period which are discovered and for which claims are filed subsequent to the period for which private insurance coverage is available; and shall also indemnify and hold harmless any other persons indemnified from all public liability arising from nuclear incidents; provided further that* the aggregate indemnity for all persons indemnified *in connection with* ~~for~~ each nuclear incident *shall not exceed* $500,000,000. *The Commission shall enter into* ~~such~~ a contract of indemnification *with each of the above described licensees for which indemnity is provided which* shall cover public liability arising out of or in connection with the licensed activity.

"d. In addition to any other authority the Commission may have, the Commission is authorized until ~~August 1, 1966~~ *ten years after the date of enactment of this section* to enter into agreements of indemnification with its contractors for the construction or operation of production or utilization facilities, or ~~research and development plants~~ *other activities involving possession of sufficient quantities of special nuclear materials to constitute a hazard involving potential widespread bodily injury to others than employees of the contractor or property damage to property not controlled by the contractor,* for the benefit of the United States in such agreements of indemnification the Commission may require its contractor to provide

financial protection of such a type and in such amounts as the Commission shall determine to be appropriate to cover public liability arising out of or in connection with the contract activity and shall indemnify the ~~persons indemnified~~ *contractors and any owner, operator, manufacturer, designer or builder of any facility or any part thereof involved in the execution of the contract, and any supplier of equipment, material or services used in work conducted under such contract, as their interest may appear,* against such claims above the amount of the financial protection required, *and any persons indemnified from all public liability arising from nuclear incidents* in the amount of $500,000,000 in the aggregate for all persons indemnified in connection with such contract and for each nuclear incident. The provisions of this subsection may be applicable to lump sum as well as cost type contracts and to contracts and projects financed in whole or in part by the Commission.

"e. The aggregate liability for a single nuclear incident of persons indemnified shall not exceed the sum of $500,000,000 together with the amount of financial protection required *of the licensee or contractor* and any other sums which may be made available by the Congress as additional indemnification. The Commission or any person indemnified may apply to the appropriate district court of the United States having venue in banrkuptcy matters over the location of the nuclear incident, and upon a showing that the public liability from a single nuclear incident will probably exceed the limit of liability imposed by this section, shall be entitled to such orders as may be appropriate for enforcement of the provisions of this section, including an order limiting the liability of the persons indemnified, orders staying the payment of claims and the execution of court judgments, orders apportioning the payments to be made to claimants, orders permitting partial payments to be made before final determination of the total claims, and an order setting aside a part of the funds available for possible latent injuries not discovered until a later time.

"f. The Commission is authorized to collect *nominal* fees from all persons with whom an indemnification agreement is executed under this section. ~~This~~ *These* fees shall be $30 per year per thousand kilowatts of thermal energy capacity for facilities licensed under sections 103 *and 104*. ~~For facilities licensed under section 104, and for construction permits under section 185, the Commission is authorized to reduce the fee set forth above. The Commission shall establish criteria in writing for determination of the charge to be made for facilities licensed under section 104, taking into consideration such factors as (1) the type, size and location of the facility involved, and other factors pertaining to hazard, and (2) the nature and purpose of the facility.~~ For *indemnification agreements executed with persons licensed under sections 53 and 185* ~~other licensees,~~ the Commission shall collect such nominal fees as it deems appropriate. *No fee under this subsection shall be less than $100 per year.*

"g. In administering the provisions of this section, the Commission shall use, to the maximum extent practicable, the facilities and services of private insurance ~~companies and insurance adjustment~~ organizations, and the Commission may contract to pay a reasonable compensation for such services. Any contract made under the provisions of this subsection may be made without regard to the provisions of section 3709 of the Revised Statutes, as amended, upon a showing by the Commission that advertising is not reasonably practicable, and advance payments may be made.

"h. The agreement of indemnification may contain such terms as the Commission deems appropriate to carry out the purposes of this Act. Such agreement shall provide that, when the Commission makes a determination that the United States will probably be required to make indemnity payments under this section, the Commission shall collaborate with any person indemnified and may approve the payment of any claim under the agreement of indemnification, appear through the Attorney General on behalf of the person indemnified, take charge of such action, and settle or defend any such action. The Commission shall have final authority on behalf of the United States to settle or approve the settlement of any such claim on a fair and reasonable basis with due regard for the purposes of this Act. Such settlement shall include reasonable expenses in connection with the claim incurred by the person indemnified, provided, however, that such action by the Commission shall not constitute an admission of liability on the part of the person indemnified.

"i. After any nuclear incident which will probably require payments by the United States under this section, the Commission shall make a survey of the causes and extent of damage which shall forthwith be reported to the Joint Committee. Except as forbidden by the provisions of chapter 12 of this Act

or any other law or executive order, such reports shall also be made available to the public, to the parties involved and to the courts. The Commission shall report to the Joint Committee by April 1, ~~1957~~ *1958* and ~~every three years~~ *annually* thereafter on the operations under this section.

"j. In administering the provisions of this section, the Commission may make contracts in advance of appropriations and incur obligations without regard to section 3679 of the Revised Statutes, as amended. Any appropriations presently or hereafter made available to the Commission shall be available for the payment of obligations under indemnity agreements entered into under this section. ~~There are hereby authorized to be appropriated $50,000,000 to be available for emergency use by the Commission upon certification by the Commission to the Secretary of the Treasury that a nuclear incident has occurred which may require payment by the Commission out of these funds pursuant to the provisions of this section.~~

UNITED STATES ATOMIC ENERGY COMMISSION

AN ANALYSIS OF PROPOSED INDEMNITY LEGISLATION (S. 715 AND H. R. 1981), AS REDRAFTED

The following sectional analysis discusses the other than editorial revisions, as proposed by the Commission of S. 715 and H. R. 1981. The parenthetical references are to the Atomic Energy Act as it would be amended.

SECTION 1

(Sec. 2i) The words "a portion of the" have been deleted since in some cases such as when the person liable was a trespasser, the Commission would assume all the risk up to $500,000,000.

SECTION 3

(Sec. 11j) The definition of "financial protection" has been broadened to cover costs of investigation, defense and settlement of claims. These costs could be very large, and are within the limits of coverage of the policy being developed for liability insurance. It has also been revised so as not to require financial protection in those areas where coverage is not available from private insurance sources (e. g., damage due to war, insurrection, rebellion, revolution, etc.), and to include descriptions of types of acceptable financial protection previously stated in sec. 170a.

(Sec. 11l) This is a proposed new section defining "indemnity" and indemnification," so as to specify that these terms will cover costs associated with processing claims, as was provided for financial protection under sec. 11j; and will include compensation for damage to property of those indemnified other than that at the site of the licensed activity where the nuclear incident occurs. (See discussion of sec. 11v.)

(Sec. 11o) This definition has been revised to provide for plural activities under a single license, and to confine the scope to production and utilization facility and special nuclear material licenses and construction permits. (See discussion of sec. 170a.)

(Sec. 11p) This section, which defines "nuclear incidents," has been revised to spell out the meaning of bodily injury and property damage more precisely, so as to assure better consistency with the insurance coverage.

(Sec. 11v) The exceptions in S. 715 from the definition of public liability of workmen's compensation claims of employees of those indemnified working with the licensed activity, and claims for property used in connection with the activity, have been revised.

The intent of the first exception is to permit indemnification of claims of employees of the licensee not working with the licensed activity. It would have the additional effect, however, of requiring that the financial protection cover such claims. The insurance syndicates plan to exclude from their liability coverage workmen's compensation claims for which the insured may be held liable. The licensee will apparently, therefore, not be able to secure financial protection for such coverage through this type of insurance, but he will have coverage under workmen's compensation insurance for all employees and no further protection appears to be necessary. It is proposed, therefore, to extend the exception to all claims covered by workmen's compensation.

The intent of the second exception is to provide indemnity for property of the licensee other than that used for the licensed activity. However, since the definition of public liability is based upon legal liability arising from a nuclear incident, and since no one is legally liable to himself, the exception would be meaningless. The liability insurance policy will not provide coverage for such property. Property insurance policies on property not used for the licensed activity will, in many cases, not provide coverage against radiation damage because capacity will not be available. A provision to provide indemnity coverage for such property has been include in section 111.

SECTION 4

(Sec. 170a) The principal revisions in this subsection are:

1. Exclusion of requirement for financial protection and consequently provision of indemnity for export licensees since the indemnity would apply only to incidents occurring in the United States and operation of reactors in this country prior to export would be covered through issuance of separate operating licenses.

2. Elimination of other Federal agencies from the bill. S. 715 does not exclude licenses for Federal agencies from the financial protection requirement, but it does exclude indemnity for them. We believe it would be more consistent to eliminate them entirely from the provisions of the bill for the reasons which follow. Outside the Atomic Energy Commission, the other principal Government agency which is involved at this time in atomic-energy activities of the type covered by the bill is the Department of Defense. We understand that DOD is considering seeking expansion of their present authority to indemnify its contractors engaged in a variety of hazardous activities, including atomic energy. It appears preferable that it be able to handle all of its indemnity problems within the same system. The Maritime Administration is, of course, actively engaged in a joint project with the Commission. The problem of liability of nuclear-powered merchant ships, since they will be operating outside of United States territory, is quite different from those pertaining to operation of facilities within the United States. The AEC and the Maritime Administration have this matter under consideration and will present recommendations on this aspect of the problem if legislative action appears necessary. We believe other agencies engaged in atomic-energy activities of the type with which we are herein concerned should consider the approach contemplated by the Department of Defense.

3. Confining indemnification to facilities and other licensed activities which involve operations constituting a possibility of widespread injury to and damage of the property of third parties. Principally, this situation exists only where there is the possibility of nuclear criticality. We, therefore, recommend that source and byproduct material licenses, and special nuclear material licenses which do not authorize possession or use of sufficient material to cause extensive third-party injury or damage, be excluded. General liability insurance available offers adequate protection for the licensed activities which we recommend be excluded. On the other hand, we believe that financial protection should be mandatory rather than permissive for those special nuclear material licensees who are engaged in operations capable of resulting in extensive damage or injury.

4. Provision that financial protection be maintained for the license period, as well as established at the time of licensing.

5. Revision of the provision requiring licensees to enter into an indemnification agreement and to make clear that such agreements are for indemnification of the licensee by the Commission.

(Sec. 170b) The principal revisions in this subsection:

1. Change the wording at the beginning of the subsection concerned with the setting of the amount of financial protection to provide that this amount shall be the amount of insurance available, except that the Commission may authorize a lesser amount based on stated criteria. This revision recognizes the general policy of the Government not to provide services which are available from private industry, but authorizes exceptions which would take into consideration factors such as size and location.

2. Provide that available insurance shall be that available on the United States market. It appears that the syndicates have secured reinsurance commitments of substantially all of that available from foreign insurance sources.

3. Eliminate the cost and terms of private insurance from the criteria. Determination of the amount of financial protection required should be based entirely on the nature and purpose of the activity and on factors pertaining to hazard. Inclusion of the criteria of cost and terms of insurance inevitably would put the Commission in the position of passing second judgment on premium rates which we feel is inappropriate because these rates are subject to approval by the appropriate state regulatory agencies.

4. Eliminate "type" from the criteria. We believe that since all types of reactors are required through the licensing procedure to be designed so as to assure safe operation and to incorporate special features to control the hazards incident to each type of design, it is not consistent to apply a quantitative evaluation to various types.

5. Provide that a temporary reduction in the required financial protection may be authorized by the Commission in order to provide reasonable time for reinstatement of the full amount of insurance in cases where this amount has been reduced by payments made by the insurer. This provision is necessary because the insurance will not be reinstated automatically in such cases.

(Sec. 170c) The principal revision in this subsection:

1. Make clear that licensees and contractors and their suppliers are indemnified above the amount of financial protection required, but that others indemnified are indemnified in full. S. 715 provides that *all* these parties are indemnified only above the amount of financial protection required, but the requirements in sections 170a and 170d of the bill apply only to the licensee and contractor. Insurance taken out by licensees and contractors to meet the financial protection requirement will also protect their suppliers, etc. However, others, indemnified, such as treaspassers, would not be indentifiable prior to an incident and, therefore, financial protection could not be required of them. It is felt that the only practical solution is to indemnify them in full. To do so will insure that there will be no gap in the compensation available to the public.

2. Include users of a facility, such as those using radiation from spent fuel elements.

3. Eliminate the exception of indemnity for Government agencies, in accordance with item 2 in the above comments on section 170a.

4. Provide indemnity for all claims filed after the end of the period for which insurance coverage is available.

5. Clarify to specify that indemnity agreements would be executed only with licensees. Suppliers and others specifically enumerated in the subsection can be issued certificates of indemnity if they request them, similar to certificates provided by the insurance industry. Others indemnified cannot be identified. (For further AEC views on sec. 170b and c, see letter of April 10, 1957, p. 78.)

(Sec. 170d) The principal changes in this section:

1. Confine indemnification of contractors to nuclear incidents arising from construction or operation of production and utilization facilities and other activities involving seriously hazardous quantities of special nuclear materials, in order to be consistent with the licensed activities indemnified. (See item 3 of discussion on 170a.)

2. Clarify intent to indemnify contractors and their suppliers above the amounts of financial protection required, and others who may be liable without regard to financial protection. S. 715 provides only for indemnification of contractors above the amount of financial protection required.

(Sec. 170f) The principal changes in this section:

1. Provide a minimum fee of $100, to avoid charging ridiculously low fees for small reactors.

2. Designate the fees to be charged as nominal, to help make clear that they are not intended to build up reserves adequate to cover possible indemnity payments.

3. Delete the provision for reduction of section 104 fees. The fees provided by the $30 per 1,000 KW formula for small research and power facilities will be quite low. For most research reactors the minimum $100 fee would apply. For small power reactors the fees will be relatively negligible, and only a fraction of the insurance premium.

4. Make clear that fees for indemnity for holders of construction permits are not to be determined by the same formula as those for facility

licenses, since there is no catastrophe potential during construction of the facility.

(Sec. 170g) Provision is made for use of the services of any insurance organization, rather than only insurance companies and adjustment organizations, in order to provide desirable flexibility. The syndicates providing nuclear energy insurance, for example, are neither companies nor adjustment organizations.

(Sec. 170i) Provision is made for annual, rather than triennial reporting to the Joint Committee. It is expected the Committee will want to review this matter each year in connection with the section 202 hearings.

(Sec. 170j) The revision in this section eliminates the authorization for an emergency appropriation. The authorization for use of available appropriations should provide all funds needed for emergencies.

Mr. PRICE. The first revision would deal with the definition in the bill of the term "financial protection" and here I think what we are suggesting is that the financial protection required not only should not exceed the amount of liability insurance from private sources—and the bill covers this—but we think that it also ought to be consistent with the scope of the coverage of the financial protection that people can get from private insurance policies.

For example, the liability insurance policies will have an exclusion dealing with damage due to war, insurrection, rebellion, and revolution. Since the reactor company cannot get private protection in any amount for that kind of a loss, we think the definition of the financial protection that we would require of the licensee ought similarly to exclude that kind of loss.

We recommend, I believe, what is probably a clarifying revision to make it clear that the cost of investigation and the cost of defense and settlement of claims be included in the——

Representative COLE. I would suggest, Mr. Price, that you follow your statement. I am having great difficulty in trying to listen to what you are saying and trying to read what you have prepared.

Mr. PRICE. I am sorry, sir. I am at the top of page 2.

We also recommend that this definition clearly include costs of investigation, defense, and settlement of claims as well as ability to respond in payment for such claims themselves. We also believe it desirable to define "indemnity" as including provision for such costs. These costs could be very large, and are within the coverage provided by insurance.

Another example of this sort is our recommendation to make the definition of "nuclear incident" more comparable to that used in the insurance policies, by including a more precise description of the damage or injury involved. We believe these revisions are important in order to eliminate uncertainty as to the adequacy of insurance to provide the financial protection required. Such provisions are also important to assure continuity of coverage in the event claims exceed the amount of financial protection required.

2. Types of licensees indemnified: We believe that indemnification should be confined to facilities and other licensed activities which involve operations constituting a possibility of widespread injury to and damage of the property of third parties. Principally, this situation exists only where there is the possibility of nuclear criticality. We, therefore, recommend that source and byproduct material licenses, and special nuclear material licenses which do not authorize possession or use of sufficient material to cause extensive third-party injury or damage, be excluded.

General liability insurance available offers adequate protection for the licensed activities which we recommend be excluded. On the other hand, we believe that financial protection should be mandatory rather than permissive for those special nuclear material licensees who are engaged in the operations capable of resulting in extensive damage or injury, primarily those involving the possibility of inadvertent criticality.

We further recommend that export licenses be excluded since the facilities involved will not operate in, and could not cause a nuclear incident in, the United States.

S. 715 does not exclude licenses for Federal agencies from the financial protection requirement, but it does include indemnity for them. We believe it would be more consistent to eliminate them entirely from the provisions of the bill for the reasons which follow. Outside the Atomic Energy Commission, the other principal Government agency which is involved at this time in atomic-energy activities of the type covered by the bill is the Department of Defense.

We understand that DOD is considering seeking expansion of its present authority to indemnify its contractors engaged in a variety of hazardous activities, including atomic energy. It appears preferable that it be able ot handle all of its indemnity problems within the same system.

The Maritime Administration is, of course, actively engaged in a joint project with the Commission. The problem of liability of nuclear-powered merchant ships, since they will be operating outside of United States territory, is quite different from those pertaining to operation of facilities within the United States. The AEC and the Maritime Administration have this problem under consideration and will present recommendations on this aspect if legislative action appears necessary.

We believe other agencies engaged in atomic energy activities of the type with which we are herein concerned should, as is contemplated by the Department of Defense, provide indemnification through their contractual authority.

3. Exclusion of workmen's compensation claims: Insurance is available and generally required to cover workmen's compensation claims in the atomic-energy field as in other industrial areas. The insurance industry has eliminated workmen's compensation coverage from its nuclear energy liability policy and we see no need for its inclusion in this bill.

Senator ANDERSON. Do you recognize that some organizations have either a reciprocal arrangement or a coverage for excess liability only, and file with the court a certificate of their financial responsibility to take care of minor workmen's compensation claims?

Mr. PRICE. Yes, sir.

Senator ANDERSON. What happens if they have a very severe incident that wipes out their capital and hence their protection to the workman? Does he just whistle?

Mr. PRICE. Senator Anderson, I am not sure that I can answer that. Wouldn't the amount of self-insurance plus the insurance policy cover the losses? That has been my assumption, sir.

Senator ANDERSON. It would unless the company goes broke. But if it had a severe accident and lost a tremendous amount of money,

the company could well become insolvent in which case there would be nothing to take care of their primary responsibility.

Mr. PRICE. I don't have any better answer, sir. I think it has been our position that workmen's compensation has been handled in this industry right along as in other industries, and that we probably ought not to cover it here, because it is available from the insurance companies. I realize there are those special occasions.

Senator ANDERSON. It is available. But suppose the business decides it will take only a Lloyd's policy covering excess limits above a certain amount, and carries all the rest of the risk itself, which it can under the laws of most States of this Union, and then because of a nuclear incident is presented with many claims of all kinds of damage. It then has no financial responsibility. So what happens to the injured workman?

Mr. PRICE. I would have to agree, sir, that in that case if the financial responsibility of the company was not adequate to cover what they had self-insured, there would not be protection.

Senator ANDERSON. Isn't that the only reason we are considering this bill at all—that the financial responsibility of the company may not be sufficient to take care of all of its responsibilities to the public?

Mr. PRICE. Yes, sir, to the public; but we had thought that so far as the extent of the coverage that is afforded by the workmen's compensation laws of the States, that coverage ought not to be duplicated. Perhaps this is wrong, but that was our feeling.

Senator ANDERSON. Since we have stopped, maybe we could go back to this Maritime Administration situation where you say the problem of liability of nuclear power merchant ships since they will be operating outside of the United States territory is quite different from the operation of facilities within the United States. Does the ship ever come to dock?

Mr. PRICE. Certainly, when they are in the United States they would be covered.

Senator ANDERSON. When standing in the Harbor of New York, Baltimore, or elsewhere, would that ship not pose just as much liability as a small nuclear plant operating on land?

Mr. PRICE. Yes, sir; exactly. Our thought was that since it has these other problems associated with it, we ought to give this subject further study and deal with stationary plants.

Senator ANDERSON. You recommend its elimination from this bill?

Mr. PRICE. From this bill, yes; but we are assuming that there needs to be an answer to it, and that we would come back with appropriate recommendations. We just have not thought through how to handle the ship problem.

Senator Anderson, I think I ought to correct that latter statement. I understand from Mr. Mitchell that this bill would cover the incidents involving ships while they are in the United States.

Senator ANDERSON. You have suggested language to revise some section. Where is that language?

Mr. PRICE. We probably did not make a suggestion there. I think the bill as drafted would probably cover the situation where the reactor is in the United States.

Senator ANDERSON. What was the purpose of the paragraph here?

Mr. PRICE. The purpose of the paragraph was to deal with the problem of what do we do then in case of an incident at sea or outside of the United States.

May I proceed, sir?

The CHAIRMAN. You may proceed.

4. DAMAGE TO OTHER PROPERTY OF LICENSEE

Mr. PRICE. We recommend revision of the provision to indemnify the licensee for property not located at the site of, and used in connection with, the licensed activity in order to assure that such offsite property will be covered.

Senator ANDERSON. Do you have the revised language?

Mr. PRICE. The purpose of this would be to take care of a company in another kind of business at another location, to give that facility the same protection as the public.

The CHAIRMAN. Would that mean coverage for every little place in the country that has some storage of fissionable material?

Mr. PRICE. No, sir. This merely means that if a manufacturer who is protected against third-party claims on account of a facility which he has—say it is a nuclear facility—this indemnity bill would not protect him for loss of a nuclear facility itself. It would protect him against claims of third parties. What we are suggesting is that if he has another plant in the next county that is unrelated to nuclear operations, and that plant gets damaged, we are suggesting that this bill cover that loss. Not the loss of the nuclear facility. He will have to take property insurance to cover him there. We are saying that if a company has a nonnuclear plant, unassociated with the nuclear plant, and as the result of an accident at the nuclear plant he suffers damage at his offsite nonnuclear plant, let this indemnity cover that loss.

Senator ANDERSON. What about that? Does the bill not cover it now?

Mr. PRICE. I think what we are suggesting is a clarification, I believe the bill intended to, and we thought the language ought to be clarified.

Senator ANDERSON. Have you the language?

Mr. MITCHELL. Yes, sir. We have submitted to your committee, Senator, a suggested redraft that indicates the changes that we contemplate. This point comes up in connection with the definitions, sir. I don't know whether you have a copy.

Senator ANDERSON. Yes; I do have. What page is it on?

Mr. MITCHELL. It is on pages 2 and 3. The first change is in section 3 (1) where we suggest that we provide specifically—this is the latter part of the definition—to pay the persons indemnified for damage to any of their property other than that located at the site of and used in connection with the licensed activity where the nuclear incident occurs.

Then you will find on page 3, in subsection (v) we would suggest striking this exception of claims for damages to property of persons indemnified which is located at the site and used in connection with, on the theory that this is not an appropriate part of a definition of public liability.

Senator ANDERSON. I am using an example now. If Westinghouse had a part of its plant at Pittsburgh and had an accident, and it also

destroyed its main operation out of this nuclear plant, that we would cover that.

Mr. MITCHELL. We would cover the main operation. Presumably Westinghouse's own property insurance would cover the reactor plant itself.

Senator ANDERSON. And we will take Consolidated Edison now. It is going to build a facility that has some nuclear and some steam—270,000 kilowatts of which the major portion may be nuclear and the other steam—if anything happens to the nuclear plant we pay the liability on the steam plant?

Mr. MITCHELL. This is on the assumption, Senator, that the property insurance of the company should cover this.

Senator ANDERSON. Where does it say that?

Mr. MITCHELL. I think you have to come to the question of what is site. Obviously you can't spell out in legislation the precise definition of what will be onsite, and what will be offsite.

Senator ANDERSON. Our report tried to make that clear.

The CHAIRMAN. I don't know whether you have a copy of the report of last year, but on page 8, beginning in the second paragraph, we cover that point. I will read it.

> The second exception in the definition of public liability is for damage to property of persons indemnified which is located at the site of and used in connection with the activity where the incident occurs, if there is a reactor incident. There would be no claim for the damage to the reactor which could be included in indemnification of the Government. However, if the same organization owned property, for instance, in another town for which nuclear insurance would not be expected, that property could be included in the property to which the indemnity would be applied.
>
> Basically, however, this exception was included because it was brought to the attention of the Joint Committee that even a small research reactor might be located on the campus of a university, if the Commission found such a location to be safe.

Mr. MITCHELL. Mr. Chairman, I believe we are both driving at the same thing. Our only point was that the owner of the property is not liable to himself. Therefore, the exception perhaps does not properly appear in the definition of public liability, but should rather appear in the section which defines the extent of the indemnity. This is what we sought to do.

The CHAIRMAN. Of course, we have not had time to analyze these changes since we just got them this morning and it makes it rather difficult.

Senator ANDERSON. That was my point of referring to the Legislative Reorganization Act. We had this just a year ago with the Commission on this very same question—the Legislative Reorganization Act. The testimony should be in in advance so that the staff or any curious member of the committee might have a chance to look at it.

Mr. FIELDS. Mr. Chairman, I believe we delivered the changes in the bill and the analysis of the bill on Saturday morning at 10 a. m., I believe. We were trying to meet the specifications.

Representative COLE. Is there any point of passing on these amendments at this meeting today?

The CHAIRMAN. No.

Representative COLE. We will all have a chance to look at them and we will probably do well to get around to completing it in 2 weeks.

The CHAIRMAN. That is very evident, because of the technical details. You may proceed.

Mr. PRICE. The next point, Mr. Chairman, deals with the amount of financial protection.

We recommend a change in the wording at the beginning of the subsection concerned with the setting of the amount of financial protection to provide that this amount shall be the amount of insurance available, except that the Commission may authorize a lesser amount based on stated criteria in the bill. This revision recognizes the general policy of the Government not to provide services which are available from private industry, but authorizes exceptions which would take into consideration factors such as size and location.

We are also recommending that the criteria for establishing the amount of financial protection to be required of the licensee be reversed to eliminate type of facility and cost and terms of insurance.

Senator ANDERSON. Why was that? You recommend leaving out cost in the first section also. Last year's report covered that quite clearly as to why we thought cost was an important factor. You decided it was not. What was the thinking?

Mr. PRICE. Our thought was that the criteria that would be left would give us a chance to put the small reactors at a very low level—the research type, and in the case of the big ones we ought to require the full amount available. We are reluctant to get into cost of insurance because it is so intimately related to the reasonableness of the rates which we don't think we ought to get into. It is a matter for the States.

Senator ANDERSON. That strikes at the very heart of the whole program. I don't know this is authentic, but I received the other day a schedule of tentative rates. I don't even classify them hardly as tentative rates. But it gave an indication of what the insurance people were contemplating.

Mr. PRICE. Yes, sir.

Senator ANDERSON. They were going to take a basic rate and establish that and then make small percentage reductions thereafter, so that the cost of $65 million of insurance would be only about double the cost of $5 million of insurance. It was the heavy basic rate which would count toward it, and everything above that was rather small. That means that a small cooperative plant in the State of Minnesota would have to pay almost as much as a 100,000-kilowatt plant in New York, and it makes it completely impossible for the small plant to operate. That is why this element of cost was in here.

Mr. PRICE. Sir, I think it is true that the incremental costs of additional millions of coverage on a reduced scale in these rates have been announced.

Senator ANDERSON. You don't see any difficulty that a small plant would have under those circumstances?

Mr. PRICE. Yes, sir. I don't think for a small plant we should require that they buy the full insurance available.

Senator ANDERSON. And you say to yourself that one of the factors you must not take into consideration is whether it costs them too much or not. If cost is the only thing, you cannot consider it. You have to make them take the whole $65 million.

Mr. PRICE. No, sir. I think we would take into account the power level in all cases, certainly, and we would have to draw a line or plot

a line on power level starting from zero up to the amount that requires the maximum amount, and take into account location, containment, and whether it is a research type reactor or a power reactor. I believe, sir, on that kind of a basis the smaller reactors would come out with a requirement of much less than the full amount and the cost would be much less to them.

Senator ANDERSON. Let us follow that a minute and see if that is exactly correct. Just outside of New York City some small locally owned private utility may decide to build a plant. It will have 5,000-kilowatt capacity where the one in New York has 250,000. It will be located, if you locate it anywhere, between Washington and New York, in a heavily populated area.

Mr. PRICE. That is right.

Senator ANDERSON. Therefore, the location factor is out. It will use the same process. It may be pressurized water. Therefore, the process is out. The only thing you come down to is whether or not that small utility can afford to pay the high basic cost of insurance. You say, that you will not let that enter into your calculations. Why do you eliminate the factor of cost?

Mr. PRICE. Sir, the only reason we want to eliminate the factor of cost is because we do not feel that we ought to get into the business of judging reasonableness of insurance rates, and we feel that this gets us into that. That is our only reason, sir.

Senator ANDERSON. Have you discussed this with insurance people and the insurance commissioners? Do the insurance commissioners when they fix automobile rates in the District of Columbia not take into consideration the reasonableness of those rates?

Mr. PRICE. Yes, sir. Each of the States will do that.

Senator ANDERSON. Is it unreasonable then for you to take a look at the reasonableness of the rates? If you are going to make a license contingent on their ability to acquire insurance, you are not going to ask whether that rate is reasonable?

Mr. PRICE. We hope to rely on the States that will have to look at all of these rates. That is the business that the State insurance commissioners are in. We are not in it.

Senator ANDERSON. They had a little nuclear incident in my State the other day. It was not a real reactor, but it was a little incident. Do you think that the insurance commissioner of the State of New Mexico is qualified to decide on the rate for a facility out there? He has no knowledge whatever of the insurance situation that would apply to that and he has no possibility of finding out anything about the atomic energy industry. He is not admitted to information. He has no Q clearance or anything of that nature. You tell me he is to decide the reasonableness of the rate?

Mr. PRICE. Yes, sir.

Senator ANDERSON. Then God help the public.

Mr. PRICE. As far as access to information is concerned, I doubt that really any classified information is involved.

Senator ANDERSON. In reactors?

Mr. PRICE. All of these rate plans that the insurance companies have been developing have been filed with all of the States.

Senator ANDERSON. Do I understand that all the insurance companies have full access to information?

Mr. PRICE. Sir, the insurance companies so far as I know have been given all the hazards information that the Commission has.

Senator ANDERSON. How about access to Reactor Safeguards Committee reports? Do all the insurance companies have those?

Mr. PRICE. They have been given access to all the hazard information that we have. I cannot say that they have been given copies——

Senator ANDERSON. I asked a specific question which you well understood.

Mr. PRICE. I would like to answer it, Senator. They have not been given copies of internal documents of the Commission. That is right.

Senator ANDERSON. Have they been given all the access to Reactor Safeguards Committee reports?

Mr. PRICE. They have not been given access to Reactor Safeguards Committee reports, except the five or six which we sent up to the committee for publication.

Senator ANDERSON. Have they asked for it?

Mr. PRICE. I don't know whether they have or not, sir. I can't answer that.

Senator ANDERSON. Does anybody on the Commission know?

Mr. FIELDS. I am not aware of any requests from the insurance companies.

Mr. PRICE. I believe the insurance people will say that they have gotten all the information that they asked for. They certainly have not gotten copies of internal documents. I would have to depend on somebody from the insurance companies, I believe, to answer whether they think they ought to have these internal documents.

The CHAIRMAN. Proceed with your statement, Mr. Price.

Senator ANDERSON. I think I ought to read into the record at this point the item:

> This request for inspection should be accompanied by a letter for authorization signed by the officer of the company to be insured. This letter should authorize the attendance of the members of the mutual atomic energy insurance pool inspection committee at meetings of the Reactor Safeguards Committee and staff meetings with AEC involving discussions of the installations to be insured.

Apparently they are going to want to know about it.

Mr. PRICE. Yes, sir. We have no intention in the world, Senator, to do other than to give these inspectors of insurance companies everything that we know about the hazards of these cases. It occurs to me that we are talking about whether they get copies of what we regard as internal documents. These they may not get and probably won't. But certainly they will get all the information.

The CHAIRMAN. This report is going to be made available today to the public.

Mr. PRICE. That report was prepared for publication, sir; that is right. I was not talking about that report, sir.

The CHAIRMAN. You may proceed with your statement.

Mr. PRICE. I had just stated the two criteria we would like to have eliminated.

With respect to type of facility, we believe that since all types of reactors are required through the licensing procedure to be designed so as to assure safe operation and to incorporate special features to control the hazards incident to each type of design, it is not consistent to apply quantitative evaluation to various types.

I am not talking about use. We will distinguish between power, research, testing. I am talking now about types in terms of pressurized water, boiling water, and so forth. We don't think we can quantitatively distinguish these.

Senator ANDERSON. Is there any suggested language to carry out what you are talking about?

Mr. PRICE. Yes, sir. It would involve merely eliminating the word "type" in the criteria for determining how much financial protection a company would have to have.

Senator ANDERSON. You don't think type is important?

Mr. PRICE. I think it is important. That is our position. Each of these reactors—take power reactors, regardless of type, as this report indicates—can build up enough fission products which if they get out would cause a bad accident. We intend that they all will have to meet minimum safety requirements in order to operate. At the present state of development of these various concepts, we don't know which ones may turn out to be the safest. Maybe they will all turn out to be equally safe. Maybe some of them will turn out to be safer than others. But right now we don't know how to put a quantitative evaluation on safety of the various concepts of power reactors, and we think that we ought to, therefore, treat them the same in that respect.

Senator ANDERSON. Is it possible that one type will have had more operating experience than another type?

Mr. PRICE. If some types are built and operated for a good long while, that would be right.

Senator ANDERSON. Would that not be a factor in the mind of the insurance carrier?

Mr. PRICE. I am sorry, I don't understand the question.

Senator ANDERSON. Wouldn't the long operation of one particular type and the experimental nature of another type have something to do with the thoughts of the insurance carrier himself?

Mr. PRICE. I think our feeling is that they are all experimental. There are possibilities of danger in all of them. Since we are talking about protection against the conceivable though remote accident that we hope will never happen, we feel we ought not to try to make a quantitative distinction here.

Senator ANDERSON. I think I can cover what I have in mind with one more question. There was a long testing of a process that eventually resulted in the building of the *Nautilus*. The *Nautilus* has now performed for a long time, relatively speaking, very, very successfully. It apparently has no inherent dangers in it whatever. If a new plant was to be built along the lines of the *Nautilus*, would you think that you should not take that long experience into recognition if it was to be side by side with a plant that was to use a homogeneous process that has not been well tested? You would think there was no difference in risk?

Mr. PRICE. Sir, we would certainly have confidence in the safety of the *Nautilus* type, that is right. Our difficulty would be in assigning to the homogeneous or the other type a risk which perhaps it doesn't have. It may turn out to be just as safe.

Senator ANDERSON. Doesn't the bill merely say that you shall take that into consideration if you decide upon the amount of insurance

available? If you decide you don't have to add any penalties, you don't have to. But if you decide you should, it would be a handy device; would it not?

Mr. PRICE. I think our feeling is, and it coincides with the conclusions of the report that you got last Friday, that this is just such a hard task to try to quantitatively evaluate these types—and since they all are conceivably possible of having a big accident—we ought not to try. If it is the will of the committee and the Congress that we must do it, we will have to try.

Senator ANDERSON. What do you mean by the term "quantitatively evaluate"?

Mr. PRICE. If we have to give weight to the factor of type, presumably a pressurized water reactor and a homogeneous reactor, where everything else is equal—size, containment, population density, and all those things are equal—then according to this bill we would have to decide whether one of those ought to have more private insurance than the other on account of type. We find that kind of a determination very hard to make.

Senator ANDERSON. Is that a quantity determination?

Mr. PRICE. It certainly would be if we have to say that the homogenous, because it has not had any experience, ought to have X million, and maybe the pressurized water would have something less.

Representative COLE. Senator, I think you are entirely right, although Mr. Price has been using that word "quantitative" and I don't understand the meaning. Don't you mean qualitatively?

Mr. PRICE. All right, qualitatively.

Senator ANDERSON. Then I can understand.

Mr. PRICE. I agree that it is qualitative judgment as to whether or not one is safer than the other, but in order to come out with a result, if we have that criterion, we are dealing with quantities because it means that, other things being equal, the difference in type might result in the pressurized water reactor being required to take X quantity of insurance—that is the quantity I am talking about—and the other one requiring to take X minus or plus.

The CHAIRMAN. Proceed, Mr. Price.

Mr. PRICE. At the top of page 6—I don't believe there is anything that has not already been said about cost.

We recommend that there be eliminated from the proposed criteria cost and terms of private insurance. We feel that the amount of financial protection required should be based on the nature and purpose of the activity and factors pertaining to hazard. Inclusion of the criterion of cost and terms of insurance in setting financial protection inevitably would put the Commission in the position of passing second judgment on the reasonableness of premium rates. The reasonableness and adequacy of these rates are subject to approval by the appropriate State regulatory commissions.

Senator ANDERSON. That is the whole point. You do not want to consider the reasonableness of the insurance rates. You want to leave that to the individual 48 States.

Mr. PRICE. That is right.

Senator ANDERSON. And the District of Columbia, which has a regulatory authority. I would like to put in the record the paragraph on page 11 of the committee report which outlined why we felt

it might be desirable for the Commission to decide that a reactor in a remote area might not need as much insurance as a reactor operating in the middle of the city of New York. We thought that was sensible.

(The information referred to follows:)

Subparagraph b sets the maximum amount of protection which the Commission might require at the amount of private insurance available from private sources. The Commission is authorized to set lesser amounts of financial protection which is required, based on such items as the cost and terms of the private insurance, the type, size, and location of the facility and other factors pertaining to the hazard and the nature and purpose of the facility. Thus, if there is $65 million available as insurance on a 100,000-kilowatt reactor, a 5,000-kilowatt reactor might not be required to furnish financial protection equal to the full amount of the $65 million. Also, if there is $65 million available for a reactor which is located in a relatively little populated area of the country, the Commission might find that a reactor located in a completely desert part of the country need not require as much financial protection. If the Commission wants to encourage a university to do research work, it might require less financial protection as an inducement to having the research work carried on. However, it is expected that the Commission would arrive at the criteria by regulation so that, as closely as possible, persons engaged in similar enterprises are treated alike. Thus, if a public or cooperative body wanted to build a large size reactor for the production of power, it would have to meet the same requirements for financial protection as a private company. One point of caution should be mentioned. The reference to the cost of insurance in this subsection is not intended to encourage the Commission to undercut the amounts of private insurance provided at reasonable rates. Since the program is so new, and no rates are yet established, the Commission must be in a position to set the amount of financial protection required at an amount lower than amount of private insurance offered if the rates appear high and all other factors indicate a lower amount is appropriate. Instead, it is merely to give the Commission a chance to look at the economics of the operation of the particular kind of reactor in deciding the amount of financial protection which may be required.

The authority given the Commission by this section to gage the hazards of a possible activity from the protection point of view, is not intended to exclude in any way or to supersede the power of the Commission under the other authorities in the Atomic Energy Act to establish safe operating conditions and safe operating localities for the reactors. The obligations on the Commission under these other powers continue unabated.

Mr. PRICE. We agree with that.

Senator ANDERSON. I beg your pardon?

Mr. PRICE. Yes, sir. We might require a less amount of protection on account of that. It would not be on account of cost. It would be on account of hazard. It is remotely located, so it would get a lesser requirement of insurance.

Senator ANDERSON. If you are not interested in the amount of cost, why do you worry about how much insurance they are going to take? It is because the extra insurance costs more, isn't it?

Mr. PRICE. Senator Anderson, I think what we are saying is that if 2 reactors are similar in all respects, except 1 is close to a big city and the other is in a very sparsely populated area, we would take that difference into account.

Senator ANDERSON. In doing what?

Mr. PRICE. In determining the total amount of insurance each company had to buy.

Senator ANDERSON. And isn't that a matter of cost?

Mr. PRICE. If that is what you mean by cost, then we are taking it into account.

Senator ANDERSON. If you are going to get $65 million of insurance at the same rate as $5 million of insurance, it would not matter much, would it? It is a factor of cost?

Mr. PRICE. I think we come out with the same results, Senator. We would factor those two cases on the basis that one is in a populated area, and the other one is not, and they would therefore get a different requirement on amount of insurance that they would have to buy. Sure, one would pay more than the other.

Senator ANDERSON. The real fundamental difference is that you object to the AEC having any control over rates.

Mr. PRICE. That is right.

Item 6 on page 6, Indemnification of Licensees and Others. We recommend that the provisions with respect to indemnification make clear that licensees and contractors and their suppliers be indemnified above the amount of financial protection required, but that others indemnified be indemnified in full. S. 715 provides that all these parties are indemnified only above the amount of financial protection required, but this requirement is made only of the licensee. Insurance taken out by licensees and contractors to meet the financial protection requirement will also protect their suppliers.

However, others indemnified, such as trespassers, would not be identifiable prior to an incident, and, therefore, financial protection in advance could not be required of them. They will probably carry no insurance protecting them against liability arising from accidentally causing a nuclear incident. It is felt that the only practical solution is to indemnify the latter in full. To do so will insure that there will be no gap in the compensation available to the public.

Senator ANDERSON. Whom do I understand you to mean by a trespasser?

Mr. PRICE. Perhaps that is a bad word. Let me use the kind of example that comes to my mind. We will require this insurance of the power reactor company and all of his suppliers. but suppose the nuclear incident is caused by an airplane falling on the site or the installation; we will not have required the airplane to take out this insurance.' Our theory is; in case an incident results from that, the public ought to be protected up to the $500 million of this bill from the first dollar on, because there won't have been any opportunity for us to require private insurance to cover that situation.

Senator ANDERSON. That is a good example. Let us stay with it, now. Do I understand it to be your contention if an airplane drops upon a large reactor or a battery of reactors and causes a nuclear incident that the owner of that battery of nuclear reactors has no liability since he did not cause it primarily?

Mr. PRICE. I don't think I can say that he has no liability.

Senator ANDERSON. We have either to say he does or does not, or he does not need it. Do you believe that if somebody borrows my automobile and runs into a person that I am not liable?

Mr. PRICE. I understand that you are, sir.

Senator ANDERSON. Somebody drops an airplane on a reactor; do I understand that the people operating that reactor are not liable?

Mr. PRICE. They may not be. That is my understanding.

Mr. MITCHELL. I don't think anyone can say in advance, Senator Anderson, whether or not the reactor operator might be liable. It is

conceivable that the court might decide that the only person responsible was the owner and operator of the airplane, in which case he would be the only one that would be legally liable.

Senator ANDERSON. We had a situation one time where a man drove a truck into a gas tank which was generating gas. Would you take your position that the gas company had no liability?

Mr. MITCHELL. I am not saying, Senator, that it might not be liable. I am saying it is conceivable that the court would hold that it was not. To the extent that the reactor owner or operator is liable, he would have his financial protection to look to and the indemnity over and above that. We are trying to make sure that the public is protected in the event that the airplane owner is the only one that the court decides is responsible.

Senator ANDERSON. I don't say you haven't a point. I don't believe you do. I hope counsel will run down the insurance cases and see if he can find one decision when there is no liability because a trespasser or inadvertent person caused an explosion at a plant.

The CHAIRMAN. You may proceed.

Representative COLE. What do you propose to do about that?

Mr. PRICE. What we propose, Mr. Cole, is that the bill be modified so that in the event it is determined in a case like that that the only liability rests on, say, the airline company, in that event the public would be protected from the first dollar of loss up. In other words, there is no private insurance to cover that situation.

Representative COLE. Why can't you approach it the other way and require that the private insurance cover situations like that?

Mr. PRICE. I think our difficulty is that we don't know any practical way of guessing at the kinds of situations involved.

Representative COLE. You do not have to guess. You just require it as one of the conditions of the policy. The reactor operator will be indemnified for public liability even though the incident was not of his control.

Mr. PRICE. It does indemnify him.

Representative COLE. I am talking about the public. It is on that same theory that the Senator is liable for the death of a man because somebody uses his automobile. The law imposes that liability on him. That is the same theory we could apply here.

Mr. PRICE. Mr. Cole, I think whether or not the reactor owner is liable in this case in that kind of example is a matter of State law. As Mr. Mitchell says, if the court would hold that this reactor owner had no liability, than indemnifying him does not help any.

Senator ANDERSON. Mr. Mitchell would help us if he gave us one court decision to hold otherwise. This looks like a device to take the insurance companies off the hook. I don't know whether it is.

Mr. MITCHELL. That is certainly not our intention.

Senator ANDERSON. Then why not do what Mr. Cole suggested. Make them liable.

Representative COLE. I did not say make them liable, but make their policy read—if they are found to be liable, they are protected.

Mr. PRICE. That is in here, sir. Any time that the reactor owner is found to be liable, then his insurance carrier will have to be liable. We are only trying to cover the case where the court would hold that the reactor owner had no liability, and hence the insurance carrier would not be liable.

Representative COLE. The whole theory of this is to protect the public against atomic hazards.

Mr. PRICE. That is right.

Representative COLE. Can we in good conscience allow a situation to exist where the public can be damaged and yet the public cannot recover damages?

Mr. PRICE. That is our whole purpose, sir. We don't think we can, and that is why we want to make this change.

Representative COLE. This gesture.

Mr. PRICE. No, this change.

Representative COLE. I thought you said gesture.

Mr. PRICE. No, that is why we want to make this change.

Senator ANDERSON. You could not provide the insurance companies with a finer loophole if you stayed up all night. All they have to do is to find some innocent trespasser came in and turned off a whole switch and brought about the whole incident and they are eliminated from their $65 million coverage, and the Government takes it all. I am not going to be for that if I can help it. I like Mr. Cole's suggestion if there is any doubt about it, and the airplane person caused it; that does not relieve anybody from the liability that normally would be theirs.

Representative COLE. Would that add materially to the cost of the insurance?

Mr. PRICE. Mr. Cole, I believe the insurance companies would have to respond to that. It is my understanding that the whole theory of liability insurance is to protect the insured to the extent that he, the insured, is determined to be liable. I do not know of any liability policy that covers an insured where he is not legally liable. Maybe there is such a thing.

Senator ANDERSON. Have you ever seen a workmen's compensation policy?

Mr. PRICE. Yes.

Senator ANDERSON. Can an employer come in and claim that the accident was caused by the employee's negligence and thereby deny liability? That is why they switched from employers' liability to workmen's compensation.

Mr. PRICE. That is right. There are workmen's compensation statutes dealing with the situation.

Senator ANDERSON. You will see liability policies also designed to protect the public, or there would not be compulsory liability policies in some States.

The CHAIRMAN. You may continue, Mr. Price.

Mr. PRICE. Item 7 on page 7 deals with the kinds of contractors of the Commission that would be indemnified. We recommend that contractors indemnified be defined to encompass those engaged in the same types of activities for which special nuclear material licensees would be indemnified, rather than including construction or operation of all research and development plants as provided in S. 715. It is proposed, therefore, that indemnification of contractors be confined to those engaged in construction or operation of production or utilization facilities, and those using sufficient quantities of special nuclear material to cause extensive public injury or property damage.

8. Determination of indemnity fees. We recommend revisions in the provisions for establishing fees for the indemnity to make clear

that these fees are not intended to build up reserves on an insurance basis. We propose, therefore, that all fees be designated as nominal. We also propose that the provision for reduction of section 104 fees be eliminated. The fees provided by the $30 per 1,000-kilowatt formula will be quite low for research and small power reactors. The additional encouragement possible by reducing them would represent a relatively insignificant element of the total operating cost.

Another recommendation with respect to fees is to provide for a minimum of $100 per annum for otherwise the formula contained in S. 715 would result, in the case of small research reactors, in an amount we think too insignificant to bother to collect. For example, the fee under the formula for a 50-kilowatt reactor would be only $1.50 per year. We suggest you make it $100 minimum.

We have incorporated the above recommended revisions in a redraft of S. 715 which is attached. We also submitted an analysis of these and a number of other more detailed revisions which we are recommending in the interest of securing additional clarification and improving the mechanics of administration. The Commission staff will be glad to discuss these revisions in more detail with the committee's staff if this would be helpful to the committee.

That, Mr. Chairman, concludes my prepared statement on the suggested revisions.

The CHAIRMAN. I might say that I thought we were pretty near together last year when we reported out a bill, but how many revisions have you made here in this bill? I have not had time to look it over.

Mr. MITCHELL. I think, Mr. Chairman, a good many of them are just drafting changes. I don't really believe there are any substantial differences, except as we have outlined them in Mr. Price's testimony.

Senator ANDERSON. To come to this question of fees, for example, our report at page 13 says—

> subsection (f) establishes the charges for reactors which have been proven to be of commercial value under section 103 at $30 per thousand kilowatts of thermal energy capacity. For research and development reactors which can be licensed under section 104, the Commission is authorized to charge less than $30 per year for the indemnity.

Doesn't that give you the authority to do what you want to do?

Mr. PRICE. I think what we are suggesting, sir, is that $30 might be just the minimum, whether it is 104 or 103, since it is a very small amount, anyway.

Senator ANDERSON. Your testimony says, for example, the fee under the formula for a 50-kilowatt reactor would be only $1.50 per year.

Mr. PRICE. That is right. It seemed to us that maybe there ought to be a $100 minimum. Under the formula of the bill as written, a 50-kilowatt reactor would have to pay $1.50 a year for this indemnity. We are suggesting that there be a minimum of $100 as the charge for the indemnity.

The CHAIRMAN. Have you conferred with the insurance companies on these changes that you have recommended in the act?

Mr. PRICE. Yes, sir. We have discussed these changes with representatives of the insurance companies. I don't think there are any recommendations in here that members of the insurance companies are not aware of.

The CHAIRMAN. They are aware of all the amendments proposed?

Mr. PRICE. I believe that is right, sir.

The CHAIRMAN. Mr. Holifield.

Representative HOLIFIELD. No questions.

The CHAIRMAN. Senator?

Senator ANDERSON. Was the Joint Committee at any time consulted on any of these matters, or the staff of the Joint Comimttee? You consulted the insurance profession and asked their reaction, did you not?

Mr. PRICE. We have been working with the insurance representatives on this problem of insurance indemnity now for about the past 2 years. We started out, you will recall, appointing a group to work on this problem.

Senator ANDERSON. Did you get from them a suggestion that the close-lying property of an insured be covered in case of the reactor blowing up on the property?

Mr. PRICE. I am sorry; I don't understand your question.

Senator ANDERSON. You spoke of the fact tht if there was property damage occurring by the misbehavior of a reactor, and the same company had property close by, that it be covered for insurance under this.

Mr. MITCHELL. I think there is a misunderstanding there, Senator Anderson. We are following the same line that was in the committee bill, to eliminate any property at the site. We are taking the same definition that was in the original bill of the site and off site. The only thing we are doing is to suggest that this limitation be contained, not in the section which refers to public liability, but in the section which refers to extent of indemnity.

Senator ANDERSON. How far off site would their property have to be before the Government came in and had some responsibility?

Mr. MITCHELL. As far as was required under the original bill.

Mr. PRICE. This is purely a suggested drafting change to accomplish the same purpose of the bill.

Senator ANDERSON. Was it the suggestion of the insurance people that this question of rates be removed completely from the AEC and put under only the State regulatory agencies?

Mr. PRICE. I am sure this was discussed with the insurance companies, but I doubt it originated with them.

Senator ANDERSON. Did it originate with you people?

Mr. PRICE. I think our people felt that the question of reasonableness of rates is something that the Commission ought not to get into.

Senator ANDERSON. Does that apply also to this question of eliminating the cost factor?

Mr. PRICE. I believe that is the same question, as I understand it, Senator. Please understand that all these problems have been discussed in numerous conferences in both public meetings and other meetings with everybody that we could get some suggestions and help from. It would be awfully hard for me to identify where a particular idea here originated.

Senator ANDERSON. I do want to go to your statement that you made with reference to the Reactor Safeguards Committee reports. Did that come up in the discussion with the insurance companies?

Mr. PRICE. The only reason I hesitate, Senator, I am not sure I understand the question. If you mean by that, the question of

whether or not they ought to be given the reports, that did not come up in any discussion with the insurance companies. The confidentiality of internal documents of the Commission is a matter that the Commission has had to deal with in a variety of areas from the very beginning.

Senator ANDERSON. You are positive that this discussion did not take place as to the availability of reactor safeguard reports?

Mr. PRICE. I am sure there has been discussion of availability of Reactor Safeguards Committee reports with representatives of the insurance companies. I am confident that is true.

Senator ANDERSON. So am I.

Mr. PRICE. But the question of the confidentiality of those documents has been a question, and other documents, that the Commission has had to deal with since long before we started talking about insurance. That is all I am trying to say.

Senator ANDERSON. Are we agreed, then, that there was a discussion with the insurance companies on the question of these Reactor Safeguards Committee reports, and their availability to them?

Mr. PRICE. Sir, all I can say is that I am sure the subject has been discussed. What the nature of it was, I don't know. I haven't had any discussion in which an insurance representative said, "I want to see your Reactor Safeguards Committee reports."

Senator ANDERSON. Who then in the Commission, if you don't know about it, was present at these discussions? Because the insurance people have said they have discussed this. Who in the Commission did discuss with them the Reactor Safeguard Committee reports availability, if you did not?

Mr. PRICE. I say I have discussed the subject. I have never had an insurance representative, so far as I can recall, ask me for a copy of a Reactor Safeguards Committee report. That is all I am trying to say.

(Pertinent correspondence from AEC follows:)

UNITED STATES ATOMIC ENERGY COMMISSION,
Washington, D. C., March 29, 1957.

Hon. CARL T. DURHAM,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States.

DEAR MR. DURHAM: After the conclusion of the Commission's testimony on S. 715 on March 25, Mr. Harold L. Price of our staff told Senator Anderson that he would like to submit a letter for the record to clarify his testimony concerning discussions between the Commission staff and representatives of the insurance industry regarding availability to the insurance industry of reports submitted to the Commission by the Advisory Committee on Reactor Safeguards.

As Mr. Price stated in his testimony the subject has been discussed with the insurance industry. Representatives of the insurance industry have inquired as to the availability of these reports. The insurance people have been informed that, although they will receive all information on hazards problems, they will not be given access to internal documents themselves, including reports to the Commission from the Advisory Committee on Reactor Safeguards.

Sincerely yours,

K. E. FIELDS, *General Manager.*

Senator ANDERSON. The material which they submitted for inspection has this sentence in it:

In the letter of authorization the applicant should also agree to supply copies of the Reactor Safeguards Committee report to the inspection committee. The purpose of this letter of authorization is to guarantee full and complete cooperation of the applicant in the activities of our inspection committee.

Why do you suppose they would have put that in there if they did not feel they ought to have these reports and wanted them?

Mr. PRICE. Senator, I am sorry, I don't know what letter this is. I don't understand how the applicant could be giving a copy of the Safeguards Committee report to anybody. The applicant would not have it.

Senator ANDERSON. Do I understand that when the Reactor Safeguards Committee makes a report on the plant, let us say, of Consolidated Edison, that Consolidated Edison cannot get that?

Mr. PRICE. That is right, except you will recall that in six of these cases we made those reports available to the Joint Committee last fall. I don't know whether they have been made public or not. Our procedure is simply this, Senator. We consult the Advisory Committee on Reactor Safeguards in connection with all of the cases that present any substantial hazard question. That is our purpose. We get recommendations from this committee. To the extent that those recommendations raise hazard questions, we would in all cases let the applicant know what the hazards problems are that we are worried about, but it is not our policy to show copies of the document itself to the applicant.

Senator ANDERSON. How would it hurt the applicant to find out what is wrong with the plant he proposed to build?

Mr. PRICE. We want him to find out.

Senator ANDERSON. Then why not let him find out?

Mr. PRICE. We tell him, but we don't give him internal documents. That is the difference, with the exception I just mentioned.

Senator ANDERSON. You regard this Reactor Safeguards Committee report as an internal document?

Mr. PRICE. That is right. The Commission does, and so does the Committee, I believe.

Senator ANDERSON. Do I understand in the Michigan case that Mr. Cisler did not see the Reactor Safeguards Committee report?

Mr. PRICE. No, sir. As I said a while ago, in six cases we made this exception.

Senator ANDERSON. Would you state here that he did not see it before you made these public?

Mr. PRICE. He saw the Reactor Safeguards Committee report as a means of letting him know what the problems were.

Senator ANDERSON. That is fine.

Mr. PRICE. What we should have done was tell him the problems and not give him the report.

Senator ANDERSON. But you did let him see it?

Mr. PRICE. We did give it to him and made it public.

Senator ANDERSON. That is right. You let him see it.

Mr. PRICE. That is right.

Senator ANDERSON. You made it public several months later.

Mr. PRICE. That is right.

Senator ANDERSON. When you talk about Consolidated Edison, you said you would not let them see it. What is the difference between Mr. Cisler and Consolidated Edison?

Mr. PRICE. The Consolidated Edison report has also been made public.

Senator ANDERSON. Let us take one that has not been made public. You said you would not let him see it. You would tell him about it.

But you did let Mr. Cisler see the report before it was made public.

Mr. PRICE. That is right.

Senator ANDERSON. What is your policy, to let them see it or not let them see it?

Mr. PRICE. No, sir. Our policy is that these are internal documents and we will not let the applicant see it.

Senator ANDERSON. Then why did you let Mr. Cisler see an internal document?

Mr. PRICE. I think, sir, the only way I can answer that is that we wanted to be sure that—this was one of the first cases we had, and I think we made a mistake there. I will take a lot of credit for that mistake—we wanted to be sure that the applicant knew what the hazards were. I think the proper way to do it, and the way we are doing it now, and the way we intend to continue to do it is to be sure that the applicant knows what the hazards are, whether they came from the Advisory Committee or from our own staff, but we will do that without giving him copies of internal documents. That is our practice. I think that we have had a few growing pains here, if I may say so, and maybe we did it wrong in a few cases. I think that is the whole answer, sir.

Senator ANDERSON. My own variation with you on the question of mistake is that I think if you were going to let Mr. Cisler know, you might let the public know.

Mr. PRICE. When the public developed an interest in his case we let the public know what he knew.

Senator ANDERSON. I don't think he has any more right to these internal documents than the general public.

Mr. PRICE. I certainly agree with you. I could not agree with you more.

Mr. FIELDS. I certainly agree.

Mr. PRICE. It is our policy and the practice, I believe, is under control that we will put in the public domain either in our document room where the world can see it, or in the Federal Register, everything that we give to the applicant. This I agree with, sir.

Senator ANDERSON. I won't get into the Godiva story. We know you did not make that public very early.

Mr. STRAUSS. Senator, I wish we could get into that.

Senator ANDERSON. I would be happy to.

Mr. STRAUSS. I think it has been blown up out of all semblance to its importance. Some of the stories refer to it as the reactor which it was not. It was a criticality experiment.

Senator ANDERSON. You had the same rule for the criticality experiments as you did for the reactors. I have a copy of that here someplace.

Mr. STRAUSS. I don't know what you mean by the same rule.

Senator ANDERSON. This is a letter from Mr. Fields, dated February 6, 1957, to Heads, Divisions and Offices, Headquarters and Managers of Operations, Subject: Providing Information on Reactors to Division of Reactor Development:

The Division of Reactor Development has been assigned the primary responsibility for maintaining current at all times a list of all reactors built, building or planned in the United States, whether for domestic or foreign locations. The list includes both civilian and military reactors, both classified and unclassified. It includes reactors for all purposes such as research, testing, training,

production, propulsion, experiment, and power. It also includes critical experiments and zero-power reactors. The status of each reactor on the list is also given, that is, whether it has been dismantled or has operated and is in being or is being built or is planned.

So that critical experiments were certainly in the same category as reactors as far as furnishing information is concerned.

The paragraph on the second page reads:

This information should be transmitted directly to the Division of Reactor Development in Washington. The Washington phone extension for receipt of the information is 634.

I assume there was a complete desire to know everything that was going on with reference to these critical experiments?

Mr. STRAUSS. Senator, I am sure that the committee must be aware that there was no attempt on the part of the laboratory at Los Alamos to withhold this information from the Commission, or on the part of the Commission to withold it from the Joint Committee.

Senator ANDERSON. You would admit that the general public had the information before the Joint Committee.

Mr. STRAUSS. I don't know when the general public had the information, Senator. I heard about it when I was on the Pacific coast.

Mr. FIELDS. It is true, Senator, there were some errors in this case of how the information got to the Joint Committee. I think we should admit them. We got word to you after it had gotten into the press information. This was a mistake.

Senator ANDERSON. And after being given privately to Nucleonics magazine.

Mr. FIELDS. Yes.

Senator ANDERSON. Why it was given to the magazine rather than the wire services, I don't know, but they had several days' lead. We ought to be on the same parity as the wire services.

Mr. FIELDS. When this started out there was a feeling very definitely that this was such a minor incident in an operation that goes on day after day that there was no particular point in even making an announcement out of it.

Mr. STRAUSS. I inquired, Senator, because I was interested while I was on the coast as to the force of this explosion. I asked to have it related in terms of something that I could understand, and I was told that it was about the equivalent of the explosion of two shotgun shells. I can therefore understand the reluctance of the people who were involved to treat it as an accident of any proportions.

Senator ANDERSON. I would be glad to go into it at a later time and not today. I think it would be perfectly apparent that the people at Los Alamos might have treated it as a matter of minor importance, but that the Washington office did not look at it that way. I will be glad to go into it day by day if you desire. This is as good a time as any if that is what is desired.

The accident happened on February 12. You can check this chronology with your own records at a later time, or now.

On February 13, Dr. Norris Bradbury and other officials of the Los Alamos Laboratory, after due consideration and knowledge of the accident, decided the incident was not serious enough to warrant notification to AEC within 24 hours of the accident as is required in serious accidents. The Laboratory officials decided that the report of

the incident would be made to the AEC as a routine matter in the monthly progress report for the month of February which the Laboratory normally would submit to AEC some time in March 1957.

On the same date, Dr. D. K. Froman, Technical Associate Director, Los Alamos Laboratory, telephoned AEC headquarters, Washington, D. C., at which time he spoke with Dr. Spence and Dr. Schreiber, both representatives of the Los Alamos Laboratory who were, at that time, visiting AEC headquarters in Washington, D. C. During his conversation with the latter two individuals relative to another matter, Dr. Froman informed them of the accident to Godiva. Dr. Spence and Dr. Schreiber informally advised AEC representatives in the Division of Reactor Development of this matter.

On February 28, Dr. Glen W. Wensch, Reactor Development Division, AEC, Washington, D. C., telephoned Los Alamos Laboratory and requested details of the incident. Wensch orally was furnished details by the scientists who had been conducting the experiment at the time of the accident. Wensch recommended to the Laboratory that a report of the incident be made to Nucleonics magazine.

Mr. STRAUSS. To be made or had been made?

Senator ANDERSON. To be made. Wensch, the following day, discussed the matter with other AEC representatives in Washington headquarters, including James L. Morrisson, Office of the General Counsel, and L. P. Gise, Division of Military Applications, with regard to the effects this incident could have on the PRDC hearings being conducted.

On March 1, 1957, based on his conversation with Wensch and Morrisson, Mr. Gise telephonically contacted Richard G. Elliott, Office of Public Information, AEC, Albuquerque, and Dr. D. K. Froman, Technical Associate Director, Los Alamos Laboratory. Gise requested that the Laboratory submit a full report of the accident to AEC, Washington, D. C., as W. Kenneth Davis, Director, Division of Reactor Development, expected to testify at the PRDC hearing March 8 or March 11 and desired to have full knowledge of the incident to discuss at the hearing. Mr. Froman was requested to have the report in Washington prior to March 8. Dr. Froman was also requested to have the Laboratory prepare a suggested press release corncerning the accident to be submitted to Washington headquarters, AEC, for review and approval.

On March 4, 1957, a memorandum bearing this date was prepared by Dr. Glen W. Wensch, AEC, Washington, D. C., setting out the details of the accident based upon the information he had received telephonically February 28, 1957, from Los Alamos. Dr. Wensch pointed out that failure to publicly release information of this nature could cause criticism similar in nature to what occurred when information relative to an accident involving EBR–1 was withheld. He, in the memorandum, also suggested that a press release should be made at Los Alamos than in Washington, D. C., because coming from the Laboratory it would attract less attention.

On this same date, a teletype was sent from Dr. Bradbury, Los Alamos Laboratory, to General Starbird, Director, Military Applications, AEC, Washington—attention, Mr. L. P. Gise and Mr. W.

Kenneth Davis, which teletype contained the full report of the accident.

On March 5, 1957, teletype from Los Alamos Laboratory to Rodney Southwick, Division of Information Services, AEC, Washington, D. C., with copy to General Starbird, Director, Military Applications, was transmitted and contained a suggested press release from the Los Alamos Laboratory concerning the accident.

On March 8, 1957, a teletype from AEC headquarters to Los Alamos Laboratory was received on this date, on Friday, at approximately 5 p. m. The teletype set out a revised press release concerning the accident which AEC headquarters, Washington, D. C., requested the Laboratory to issue in lieu of the release previously suggested by the Laboratory. The teletype stated that the revised press release had been concurred in by the AEC staff and was now before the General Manager for his approval.

I do think that I should say there for General Fields that when I talked to him I am convinced that is the first he heard of this as being serious in any way, and it had not come to his attention. I would not want the record to indicate that on March 8 he got it in his hands and did something with it.

On March 11, on that date, Monday morning, a teletype was transmitted to AEC headquarters, Washington, D. C., from Dr. Bradbury advising that the Laboratory did not desire to release the suggested AEC press release in view of the fact that AEC had declined to accept the Laboratory's suggested release and had substituted its own. The teletype pointed out that the Laboratory did not consider the revised press release as their own and because of this and the fact that the Laboratory did not understand the purpose for the release it was recommended that AEC issue the release.

On the same day, a letter dated March 11, 1957, was transmitted from the Laboratory to the editor of the Nucleonics magazine setting out a report of the "Godiva" accident and enclosing four photographs of the assembly after the accident. The letter made mention of previous intercourse between the Laboratory and the editor of Nucleonics relative to the accident.

On March 15, 1957, on instructions from AEC headquarters Washington, D. C., AEC, Albuquerque, the morning of this date, issued to news services in Albuquerque, N. Mex., the press release which had been written at AEC headquarters, Washington, D. C., and which the Laboratory had declined to issue as its own. The press release carried release time as 12 noon (mountain standard time) (12 noon Albuquerque, N. Mex.).

Associated Press put the story on the wires and converted the 12 noon (mountain standard time) release time to 10 a. m. eastern standard time, Washington, D. C. This was an error in that 2 hours should have been added rather than subtracted in converting to eastern standard time. The correct release time in Washington, D. C., should have been 2 p. m., eastern standard time.

The report of the accident was broadcast in Washington, D. C., approximately at 10 a. m. this date—approximately 2 hours prior to its release time in New Mexico, where the news release reportedly originated.

At 11:03 a. m., March 15, 1957, a letter addressed to the chairman of the Joint Committee, which was dated March 14, 1957, from the

Assistant General Manager, AEC, was received at the Joint Committee office. This letter contained a report of the accident to "Godiva," a critical assembly, and represented the first formal notice the committee had of the incident.

At 2:27 p. m., March 15, 1957, the press release which was to be issued by the Albuquerque Operations Office of the AEC that date, March 15, relative to the accident was received at the Joint Committee office.

On March 18, 1957, the afternoon of this date, 3 days after the news release of the accident, the AEC congressional liaison representative in conversation with a member of the staff advised that the delay in advising the Joint Committee of the accident lay with Los Alamos in that Washington had no knowledge of the incident until the day before the Joint Committee was advised.

Mr. STRAUSS. Mr. Chairman, may I respond to the Senator?

The CHAIRMAN. Yes.

Mr. STRAUSS. I think, Senator Anderson, that this is a case where the term "accident" is a misnomer. This is the kind of mishap that occurs in the course of experimentation and of which we may have examples in the future. It raises the question in my mind as to how far the Joint Committee wishes to go in requiring reports on laboratory experiments which for one reason or another destroy the equipment employed. As it happens, I did not know of this incident until I read it in the paper. But when I read the description of it, it did not occur to me as necessarily one which I felt that I should have been informed of instantly. I was in Los Alamos within the last 10 days. I spent a day and a night and part of another day there. The matter was not mentioned in conversation. The scientists engaged in this operation obviously regarded it as of no concern and no magnitude. I regret the fact that it is described as an incident. It is a laboratory mishap.

Senator ANDERSON. You said you did not regard it as an accident.

Mr. STRAUSS. I would not by the description which I have read of it, sir.

Senator ANDERSON. When Mr. Davis was testifying in the PRDC case he was asked about that, and was pinned down and finally said it was an accident.

Mr. STRAUSS. It is a matter of definition, Senator. I would not regard that as an accident. No one was injured. No contamination resulted that was outside the container of the critical assembly, and I would assume that this was the sort of thing which we might expect to happen with some frequency in the future.

The CHAIRMAN. What was the dollar value?

Mr. STRAUSS. I am unable to answer that, Mr. Chairman. I would think it was quite small.

Mr. FIELDS. My information is that it is of the order of a thousand dollars, or something in this neighborhood.

Senator ANDERSON. I think $3,000 was the figure they published, but I would agree it is very small.

Mr. FIELDS. Yes. It is not under the criteria that requires a special report to us. Could I make one statement on this, sir? Apart from the errors that were made in coordinating the time of this release with notification to the Joint Committee—and I admit there that we

did slip and I am sorry for it—I believe that one can ascribe to what happened here from the date that this took place on February 12 up through to when it was released as due to the fact that we felt we should say something about it, but how could we say that it was not taken as a tremendous reactor accident, because it is not that. There was no intent to withhold information. There was an attempt to see what we could say about this so that people would understand it properly. That was the reason that it has taken some time in this process to do it.

Senator ANDERSON. There was also the fact that the PRDC hearing was going on.

Mr. FIELDS. That had something to do with it. We would have considered putting this out whether that hearing was going on or not, sir, in view of the concern with respect to what happens in reactors and experiments, and so forth.

Senator ANDERSON. Why do you think it was necessary to notify Nucleonics magazine ahead of the Joint Committee?

Mr. FIELDS. This apparently is a side issue that I will have to look into. I believe it has something to do with the technical man believing that there is some information here as to what happens. There is a difference between a prompt criticality and a delayed criticality. It is in this area of scientific information that there is apparently an interest in reporting it. It was no more than that and it has nothing to do with it being an accident in so far as I know.

Mr. STRAUSS. Mr. Chairman, I take a very dim view, and I think the Commissioners would, of the transmission of such information to one news medium rather than to all. That is not our policy.

Senator ANDERSON. I am sure I would be the first to agree that is the truth.

The CHAIRMAN. I believe you can arrive at different conclusions in a situation where the matters are somewhat alike. That goes into many, many questions. That is one reason why the committee wanted a full interpretation of the Commission.

(Pertinent correspondence from Nucleonics magazine follows:)

NUCLEONICS,
New York, N. Y., March 29, 1957.

Representative CARL T. DURHAM,
Joint Congressional Committee on Atomic Energy,
Washington, D. C.

DEAR MR. DURHAM: I am writing you with reference to the mention that was made of Nucleonics on Monday, March 25, during the hearings on liability coverage. This was in connection with the release of information on the Godiva incident.

Although I believe no criticism of Nucleonics was intended, I thought the situation might be clarified if I were to describe what happened, as I understand it.

First, I should point out that in the October 1955 issue of Nucleonics, we published a technical description of Godiva—what it was and how it operated.

After the accident on Godiva, we learned from the people at Los Alamos that, if we were interested, the same scientist who authored the earlier technical article for us would write a followup technical note describing the accident. It was made quite clear to us that a general press release was being considered for issuance first, about 1 month prior to the time we could actually publish the technical note. The press release was put out for publication on March 15. Our story will come out April 8.

Thus, not only did Nucleonics not get an "exclusive" but our publication is to be considerably after the first release date.

I should point out that whenever the Atomic Energy Commission issues a press release, we on Nucleonics ask ourselves whether any detailed information not included in the general release would be useful for our specialized readership. Frequently, we will then go to the source of the information and ask for considerably more detail. Sometimes, the scientist or engineer involved in the work described in a press release wants to follow the normal custom of having a technical paper appear over his name in the technical literature. And so, if Nucleonics happens to be his choice of where he wants to publish, a technical paper or note will be sent to us in parallel with the issuance of the general press release, with the realization that Nucleonics, with its monthly schedule, cannot "beat" the daily press. And I should point out that we believe our stock in trade is not scoring "beats" on the daily press, but giving our readers full background and interpretive commentary on events as they occur.

I would also like to point out that Nucleonics has gone on record in the past (for example, in an editorial on Nuclear Accidents Are Everybody's Business in the May 1956 issue) favoring full release of information on accidents in the nuclear field.

In addition to the need for informing the general public, there is also the need for informing technical and administrative people in the atomic-energy field itself. Information release through responsible channels directed at a technical audience insures balanced and thoughtful treatment of the results reported. The inability of most lay publications to maintain staffs capable of the necessary discrimination and the need to appeal to mass audiences tends to result in a more sensational treatment of the material than the actual scientific facts merit. One need only scan the headlines covering the Godiva incident as they appeared in certain newspapers to see what is possible here. (We recognize that there is involved here a whole area of education for lay reporters and do not wish this to be construed as a blanket condemnation of a medium that has done so much to foster public understanding of atomic energy.)

It would be most unfortunate if policies were to be established that diminished the flow of normal technical information because of a blanket requirement that simultaneous release be made to the general press.

I sincerely hope this letter is helpful to the committee. If it is possible, I would very much appreciate it if this letter could be inserted in the record of the liability hearings.

Sincerely yours,

JEROME D. LUNTZ, *Editor.*

(Dictated by telephone by Mr. Luntz but signed in his absence.)

The CHAIRMAN. How many more Commissioners have statements?

Mr. STRAUSS. That completes our presentation.

The CHAIRMAN. Do you desire to question the Commission any further?

Senator ANDERSON. No.

Representative JENKINS. No.

The CHAIRMAN. Then I suppose we can recess the Commission for this afternoon, and take up the industry people.

(Discussion off the record.)

The CHAIRMAN. I suppose you better come back at 2 o'clock.

Mr. FIELDS. Mr. Chairman, we could supply written statements to those questions, if you would wish, for the record.

The CHAIRMAN. That would be all right with me, Senator.

Mr. STRAUSS. Mr. Chairman, at the conclusion of this meeting, I would like to have a very brief session with you and such members of the committee as remain, to give you a piece of information.

Senator ANDERSON. I have no further questions. If questions occur to us after we have had discussions with the insurance people, we might like to submit the questions to the AEC, and would you then supply us with additional information?

Mr. STRAUSS. Yes, sir.

(The information referred to follows:)

UNITED STATES ATOMIC ENERGY COMMISSION,
Washington, D. C., April 8, 1957.

Hon. CARL T. DURHAM,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States.

DEAR MR. DURHAM: In his letter of March 20 to me, Mr. Ramey asked that the Commission be prepared to testify at the March 25 hearings on the Anderson-Price bills on the following matters:

1. The rates, terms, and coverage of private insurance for reactor hazards.
2. A description of AEC research projects on reactor hazards.
3. Comments on the desirability of the public availability of Reactor Safeguard Committee reports on power reactors.
4. Information and comments on the status of AEC regulations or policies which would establish criteria or factors as to the location and other safety arrangements with respect to reactor hazards.

At the conclusion of our testimony on March 25, you asked that our comments on these matters be submitted for the record. Accordingly, we are attaching for the record our comments on the matters mentioned above.

Sincerely yours,

K. E. FIELDS, *General Manager.*

1. COMMENT ON THE RATES, TERMS, AND COVERAGE OF PRIVATE INSURANCE AGAINST REACTOR HAZARDS

The Commission has reviewed the information which has been made available by the insurance syndicates on rates, terms, and coverage of liability insurance against reactor hazards.

As stated in the testimony presented to the committee by the Commission on March 25, the amounts of coverage offered, while considerably larger than those hitherto available to other industries, are still inadequate in view of the remote possibility of claims for injury and damage in very much larger amounts. This necessitates Government indemnity legislation so that not only will the public be adequately compensated for injury or damage but also those engaged on proposing to engage in atomic energy activities will not be threatened with bankruptcy.

With regard to the terms of the private insurance, we have considered them as they might apply to the protection of the public in the event of an accident. Our concern has been that there be no gaps between the private coverage and the Government indemnity insofar as the protection of the public is involved, and we have offered comments on the proposed legislation designed to assure that such gaps do not occur.

In announcing the tentative liability insurance rates, the syndicates have indicated that the base rates for the first million dollars of coverage will be determined from analysis of type, use, size, location, and containment of the facility. The rates for additional coverage over the first million dollars will be established on a sliding scale ranging from 50 percent of the base rate for each of the next $4 million, to 2.5 percent of the base rate for each million over $40 million. The minimum rate for any million dollar increment of insurance is $1,000 for power reactors and $500 for test and research reactors. After 10 years, all rates are subject to refunds based on loss experience.

The cost of this insurance for the power reactors is unquestionably larger than that for normal liability insurance carried by utilities. On the other hand, insurance does not appear to be as significant an element of cost in the eventual economics of nuclear power as the problems of improving technology and achieving volume in manufacturing so as to reduce direct construction and operating costs.

It appears that the relative cost of insurance will be higher for small power reactors than for larger ones. However, when one considers that other costs for the smaller projects will probably also be relatively higher, it is likely that the insurance costs will have no greater relative effect on the total cost of power from small reactors than from large. In addition, the difference may be somewhat offset by the provisions of S. 715 which will allow the Commission to fix a lesser amount of required private financial protection for the small facilities than for the large ones.

The estimated cost for liability insurance for research reactors seems to be relatively high, as compared both to the cost of liability insurance for larger reactors and to that of normal liability insurance usually carried, particularly for the educational institutions that will own many of them. Again, in these cases, the amount of private insurance required by S. 715 for research reactors would be smaller than for the large power reactors and might be further adjusted for the small research reactors.

The insurance syndicates, in announcing their rate structure, have given no indication of availability or rates of liability insurance in less than $1 million units. For critical assemblies and many of the low-power research reactors, the potential hazard may well be such that the required insurance should be well under this amount. Availability of insurance and rates in these low ranges must be developed by the insurance syndicates.

Any analysis of the impact of these rates on the atomic-energy industry must take into consideration the fact that the plan of the insurance industry to recalculate retrospectively the premiums beginning with the 10th year should substantially reduce the costs of this coverage. If there are no sizable losses, the policyholders will have refunded to them a large fraction of the premiums which they will have paid.

2. Description of AEC Research and Development Projects on Reactor Hazards

INTRODUCTORY

Safety of reactors is based primarily on full knowledge and understanding of each type of reactor and its characteristics and special problems. As each new reactor is built, tested, and operated, the values of its temperature coefficients are established and analyzed, and evidence is obtained of its operating stability and of the reliability and endurance of its equipment, materials, and instrumentation. Operating experience also affords opportunity for developing and using efficient and safe methods of handling spent fuel and waste products, and improved equipment, materials, and instrumentation. Thus, in a very important sense the entire reactor-development program can be considered as a safety program.

From the Commission's earliest days, AEC scientists and engineers have been concerned about safety. Each reactor project, both military and civilian, has been examined in detail as to safety. In many of these individual reactor projects it was considered advisable, to assure safety, to conduct a specific research and development program on a particular concept or program.

Examples of experiments specifically addressed toward the obtaining of safety information are provided by Borax I and EBR–I.

Experimenters of the Argonne National Laboratory used the Borax I reactor for a series of experiments until the fuel elements in the reactor core had been nearly exhausted metallurgically. A final experiment was then carried out in which the reactor was intentionally allowed to destroy itself. Valuable data on reactor runaway behavior were thus obtained.

During the operation of the Experimental Breeder Reactor No. I over a period of years, a temperature instability was observed. The reactor was then put through a series of experiments which deliberately included operation in the zone of instability and rapid power increase. During the last of these tests, meltdown of the core occurred.

In neither of these tests was anyone injured nor was there any offsite damage. The experimental boiling water reactor, placed in operation last December, may be cited as an example of the special safety testing which is done on a specific reactor before it is operated. As the water in this reactor boils, the steam bubbles force water from between the fuel plates and thereby create voids. These voids are important in the inherent safety of boiling water reactors. To stimulate the effect of these voids during the startup of the experimental boiling water reactor, foam-type polystyrene was packed into the reactor core. This enabled reactor design personnel to measure experimentally temperature coefficient and void effects at low temperatures.

The experimental boiling water reactor core vessel is much stronger than the theoretical design value of 600 p. s. i. (normal operating pressure). The outer containment is the result of experimental and theoretical work. It is 80 feet in diameter, 119 feet high, and enclosed 500,000 cubic feet of air and has the primary function of keeping any possibly radioactive steam or air from

escaping to the outer atmosphere. As a further example of reactor safety on a project basis, this containment vessel was pressure tested for 8 days. Air pressure inside the vessel was maintained at 15 pounds per square inch, and instrument readings on and within the shell were taken every 2 hours.

THE GENERAL REACTOR SAFETY PROGRAM

The Division of Reactor Development has the responsibility to plan and direct the Atomic Energy Commission's research and development program on reactor safety. This is done on a specific safety program basis and, where appropriate, on an individual reactor project basis. The theoretical approach is used to supplement experimental research. These programs are identified individually hereinafter.

Increasing amounts have been spent on the general reactor safety program. In the fiscal year 1955, one-third million dollars was spent. In fiscal year 1956 this amount rose to $1½ million. Expenditures in fiscal year 1957 will amount to approximately $5 million and for fiscal year 1958 a program is planned in terms of $8 million. In addition to the general reactor safety program, there has been budgeted for a fast reactor safety program about $1½ million for fiscal year 1957 and $2½ million for fiscal year 1958. These figures do not include the amounts spent directly for safety on the individual military reactor projects or civilian reactor projects such as Borax I. They also do not include the money spent to develop means of disposing safely of radioactive wastes. This is a separate program which is also concerned with the health and safety of the public.

SAFETY TEST REACTORS

Of particular significance and importance in matters of reactor safety are the seven thermal and fast reactors devoted to safety and transient testing—i. e., testing the dynamic behavior of the reactor when subjected to both sudden and slow changes in reactivity. Three are built (SPERT I, KEWB I, EBR I) and four are in design or construction (SPERT II, SPERT III, KEWB II, TREAT). All of these reactors are presently or will when built be devoted exclusively to safety research.

THERMAL REACTORS

The thermal reactors are the SPERT series (special power reactor excursions test) at NRTS and KEWB series (kinetic experiment on water boilers) near Los Angeles.

SPERT I is an unpressurized tank type, water moderated reactor which became critical July 11, 1955. It was specifically designed for transient testing and has given valuable information which has been specially reported to access permit holders and others.

It should eventually indicate, among other things, what design characteristics are necessary to prevent divergent power oscillations on normal reactors. Information on the temperatures that will cause the fuel element to melt during a transient should also be obtained. As part of this program, there is also a theoretical study of the experimental phenomena.

From the SPERT work it is felt that crucial information can be obtained about transients in water-cooled reactors by new and specifically directed studies of bubble formation and of heat transfer from the fuel element to the water. This will include experimental treatment as well as additional theoretical work on establishment of a mathematical model of the SPERT instability.

SPERT II is to be a pressurized water reactor of medium pressure and temperature, 300 p. s. i., 400° F., designed to fill in test technology between SPERT I which is unpressized and SPERT III which is high pressure. It is now in design. The estimated construction completition date is June 1958 at an estimated cost of $2 million. It will use D_2O or H_2O as a moderator. Reflector thicknesses can be varied; solid reflectors can be used. Its purpose is to obtain information leading to safer design of this type reactor. The neutron lifetime will be measured under various conditions, the effect of water flow will be determined, both up and down through the core, and transients will be run under various conditions. There are no heat exchangers and the steam will be vented to the atmosphere.

SPERT III is also a pressurized water reactor designed to operate at high temperature and pressure, 2,500 pounds per square inch and 668° F. It has

two 30-megawatt heat exchangers with the shell side vented to the atmosphere. The core vessel is designed for 3,500 pounds per square inch. Construction is currently underway and is scheduled for completion early in 1958 at an estimated cost of $2,500,000.

The purpose of SPERT III is to develop safety information on the operation of high-pressure water reactors. This will be done by basic transient studies. Investigations will be made into startup accidents, the first being the "blind startup," i. e., no nuclear instrumentation in the subpower region. This startup accident study will continue by extending the ramp beyond the subpower region.

"Cold water" accidents will be investigated by operating on one coolant loop and suddenly bringing on the second loop at a lower water temperature. This increases the reactivity and produces a transient. Small experiments of this type have already been performed on the *Nautilus* prototype at NRTS.

Loss of flow studies will be made. Also boiling studies will be made under (1) steady state conditions and (2) transient conditions with natural convection bulk boiling and forced convection nucleate boiling.

KEWB I is a homogeneous water boiler reactor, costing $500,000, that became critical in July 1956. It has a spherical core vessel and graphite reflector and is rated at 50 kilowatts. It is located in the Santa Susana Mountains near Los Angeles and is operated by North American Aviation.

It is also a test reactor, designed to obtain data which will lead to safer designs of water boilers. One characteristic of this type of reactor is that radiolytic gases are released. These form voids which create a shutdown mechanism which is a more effective shutdown device than the negative temperature coefficient. However, hydrogen and oxygen can be present in explosive amounts and a recombiner is necessary. KEWB I will be used to make transient investigations and will also be used to investigate the various operating parameters such as (1) void volume above solution, (2) initial solution temperature, (3) initial core pressure, and (4) initial power level and many others.

As an example of the use of the experimental boiling water reactor, the operating power of the Armour Research Foundation's new water boiler reactor has been limited to 10 kilowatts, although it is designed for 50 kilowatts. It is deemed advisable to run transient tests on KEWB and do other experimental work before full power operation is authorized for the Armour reactor.

KEWB II will study the effect of different core shapes on water boilers. It will cost approximately $800,000, and will be operational in early 1958.

FAST REACTORS

EBR–1: A new core is being fabricated for the Experimental Breeder Reactor–1 (located at NRTS). This core, together with modifications in the reactor itself, is scheduled for installation soon and the reactor should go critical once again in August 1957. It will be used to investigate various problems of instability associated with the EBR–1 reactor. To investigate the temperature coefficients of reactivity the new EBR core (designated Mark III) will be provided with special devices so that when the core is assembled and clamped together, it will form a rigid assembly and prevent fuel-element bowing.

Upon completion of the experiments on the rigidized EBR–1 core, the fuel-element pins and subassemblies will be modified so that the bowing of fuel elements can occur. Tests will again be conducted so that effects of fuel-element bowing upon nuclear stability may be studied.

In addition, investigation can be made of the significance of series as compared with parallel flow on the creation of resonances, and valuable experience will be obtained on the feasibility and reliability of oscillator tests as a means of determining the nuclear stability of fast reactors.

TREAT: A new facility is being designed by Argonne National Laboratory in conjunction with Los Alamos Scientific Laboratory to determine melt down behavior of simulated fast reactor fuel elements under nuclear conditions. Designated the Transit Reactor Test Facility (TREAT), this project is in early design stage, is planned for construction at NRTS, and is not expected to become operational until June 1958. A tool useful for this investigation will be high speed movies made during melt-down tests.

In addition, work done with critical assemblies at the Los Alamos Scientific Laboratory is providing valuable theoretical and analytical assistance to the fast reactor transient program. Studies with the Godiva critical facility which

is being replaced, will continue. The Godiva experiments, including the recent accident, have furnished us with valuable information concerning assemblies of critical masses in a fast system.

NUCLEAR MELT-DOWN PROGRAM

A problem which arises primarily with fast reactors is the possibility the fuel elements could melt down, assemble in a critical mass, and thereby cause a nuclear explosion sufficient to breach the reactor vessel. This problem is being attacked in several ways:

(*a*) Studies of behavior of fuel elements when melted by nuclear means are planned to be made in the TREAT facility, referred to above.

(*b*) A cooperative program of theoretical and experimental analysis of the energies which could be released by such an assembly following a meltdown is being pursued using Godiva reactors, by the Los Alamos Scientific Laboratory and the Argonne National Laboratory.

METAL-WATER REACTION AND METAL-IGNITION PROGRAM

It is recognized that a power excursion in a reactor or the loss of coolant from the core might cause destruction of the reactor by the chemical energy released through metal-water reactions.

There are a number of programs being conducted which are investigating both the nature and the consequences of such reactions.

At Columbia University a metal strip in water is used to simulate a fuel element in moderator. A nuclear excursion is then simulated by sending a tremendous electric current through the metal strip. The melting or vaporization that occurs in the water environment is photographed by a highspeed motion picture camera. This work is being coordinated with other work in this field.

The Aerojet-General Corp. at Azusa, Calif., is studying the kinetics involved when molten metal is sprayed into water. An explosion dynamometer measures the energy released and the cooled metallic particles are analyzed carefully for amount of oxide, metallic structure, and other results.

In addition Aerojet has a long-range theoretical approach designed to provide a basic understanding of the process.

A few inpile tests have been conducted to determine if the mechanism of a metal-water reaction is affected by a strong radiation field. To date the evidence is not conclusive and more of these tests are needed.

An entirely different approach to this problem is being made by KAPL wherein NaK at room temperature is used as the molten metal, and water vapor in an inert gas is used as the reacting water. This simulates the steam blanket that will always exist where a molten metal contacts water.

Other experiments have also been conducted, none of which have provided the desired result—namely, what forces can be expected in a reactor from metal-water reactions, why, and under what conditions.

It is generally known that many spontaneous ignitions of uranium, zirconium, and other metals have occurred. These ignitions have occasionally taken place in metal initially at room temperature and even in apparently bulk metal. A study of the circumstances surrounding each ignition did not definitely indicate the cause.

It is desirable, of course, to find out the nature of these conditions. The Argonne National Laboratory is working on this by studying the oxidation reactions of uranium and other metals. The United States Bureau of Mines, at Pittsburgh, is doing research on the sensitivity of zirconium to friction, impact forces, thermal stimuli, and electrostatic stimuli.

REACTOR FUSES

As a final possible device to keep a reactor from "running away," we have undertaken research and development on reactor fuses.

Organizations such as General Electric and Westinghouse have done development work on reactor fuses, although the major effort at the present time is through North American Aviation.

Research reactors appear to be adaptable to the use of fuses and present development is pointed toward using a vacant fuel element space or a vacant reflector element space for the fuse. The idea behind this type fuse is to store a reactor poison such as BF_3 in the fuse mechanism above the core. This poi-

son will be automatically released into a fuse receiving chamber which will be designed to fit into the vacant fuel or reflector element space and thus shut down the reactor when the power level is too high or when a power excusion takes place.

It is desired to develop fuses that are extremely fast, reliable, not subject to false scrams or small variations in power level, earthquake proof, tamper proof, and "fail safe."

An important parameter is the response time of a fuse. Present development indicates this can be worked out satisfactorily. For long reactor periods the fuse will operate as a function of the power level and the response time is less important.

Work is also proceeding on fuses for power reactors. Although the general operating principle will be the same as for the research reactor, it is estimated that the development will be more difficult.

As yet it is too early to say definitely that effective reactor fuses can be developed.

REACTOR CONTAINMENT

Reactor containment is the final means of assuring that the health and safety of the public is protected in the very unlikely event of all other safety devices failing.

Some reactors have been built within a steel shell which would contain a blast if it were to occur and would also contain any fission products that were released. These steel, gastight containers utilize pressurized doors. A concrete lining is sometimes used to stop missiles or flying fragments which might possibly result from an explosion. The EBWR is designed so that in the unlikely event of an explosion, the force would be downward into the heavy concrete base where it would be attenuated.

There is in effect a research program to find out more about the important matter of containment. In this connection we are very pleased with the cooperation we have received from other Government agencies such as Department of Defense and Bureau of Mines.

This research and development is accomplished by means of a series of contracts:

(1) The Naval Ordnance Laboratory, White Oaks, Md., is investigating the core vessel. These experiments consist of igniting a propellant in especially designed water-filled vessels. Propellants are used because they are slower burning than high explosives. They thereby more nearly simulate, it is thought, the type of explosion that might exist. In order to gain homogeneity in the metal, the stainless steel vessel is centrifugally cast. In previous tests the experimental vessel would rupture at the welded joint. In this connection, there is a program directed toward development of a better stainless steel welding electrodes. In addition to the simple symmetrical core vessels being studied by the Naval Ordnance Laboratory, Pennsylvania State University is investigating the stresses developed in vessels at nozzle openings. The Naval Ordinance Laboratory is also investigating, under AEC contract, the effectiveness of the various containment structures proposed for the PRDC reactor.

(2) At the Aberdeen Proving Grounds, Md., of Army Ordnance, experiments are underway on the outer, or vapor, containment shell. Core vessels have been simulated with 2,500 p. s. i. strength oxygen tanks. These were ruptured by use of high explosive, propellant, and static pressure to see under what conditions a shock wave was created. It was determined that only high explosives and propellant caused a shock wave. With this basic information established, the next series of experiments will use a TNT charge to simulate the shock which may be created by a rupturing core vessel. The TNT will be detonated on a series of right cylinder containers, with hemispherical ends, of varying size to simulate the outer or vapor container. By using vessel diameters of 2½ feet, 5 feet, 10 feet, and 20 feet, and proper instrumentation, it should be possible to establish scaling laws which will permit application of the results to full size containment. Related theoretical work is also being done.

(3) We have two contracts with the Armour Research Foundation in Chicago. One of these is small and is aimed at investigating the velocity of sound in water containing gas bubbles. Vibrations in reactors have been observed which could be explained if a water-steam mixture propagates sound at a velocity considerably less than either constituent. Studies are now being made in mixtures of 1 percent to 50 percent gas.

The other Armour program which has just begun is both experimental and theoretical. The experimental program will investigate the material of containment construction. These experiments will include the determination of the crushing strength of concrete as measured in a shock tube and the effects produced by reinforcing steel. Tests will be made on proposed shock wave absorbing materials with the view in mind of developing an adequate blast shield for reactor containment use. Field tests of scale models of blast shields will be made.

The theoretical program will supplement the experimental program as needed.

(4) A contract has just been negotiated with Stanford Research Institute to study the containment of high-velocity fragments resulting from an explosion. An investigation will be made into the penetration of various target materials by fragments of different character, size, and velocities.

OTHER SAFETY PROGRAMS

It is known that volatile radioactive fission products could conceivably get into the atmosphere (although this possibility is extremely remote) if the fuel element were to melt during an accident in which the reactor and containment were breached.

To study this, the Oak Ridge National Laboratory has melted irradiated uranium by induction and measured the off gases. In this experiment it was found that about 60 percent of the noble gases, xenon and krypton, leave the metal as well as 25 percent of the iodine.

In the field of reactor instrumentation and control, there is a contract now in effect with the Ford Instrument Co. to develop safer control devices and to investigate automatic but supervised startup of complicated reactors.

Work has been completed at the Bureau of Mines in Pittsburgh on the combustion and explosion hazards of hydrogen-water vapor-air mixtures that might exist in water moderated reactors. Various burnout programs have been completed which provided information relating to safety. Constant study is being given to radiation damage of various types of reactor materials.

The above describes the expanding research and development program in reactor safety. In this connection, the Atomic Energy Commission realizes the necessity for further emphasis in this field. We therefore plan to add to this program in order to do everything possible to assure safe design and operation of nuclear reactors of all types.

3. Comments on the Desirability of the Public Availability of Reactor Safeguard Committee Reports of Power Reactors

In discussing this question it would seem appropriate first to explain the system of reactor safety evaluation now being practiced by the Commission so that the role of the Advisory Committee on Reactor Safeguards in such evaluation is clearly understood and the relationship of that Committee's reports to the total available hazard information is placed in proper perspective.

As has been pointed out on numerous occasions, the initial evaluation of the safety of a reactor is required by our regulations to be made by the applicant for a license and is submitted to the Commission as a part of his license application. The portion of the license application containing the report of such evaluation, generally known as the Hazards Summary report, is prepared by the reactor designer and covers in detail the design, operation, supervision, containment, and location of the reactor. It must give an analysis of all known hazard aspects which are affected by the design and operation of the reactor, and show how the accident probabilities of the reactor have been reduced to an acceptable minimum; it must define the events which could result in the worst credible accidental release of energy (maximum credible accident), and show that, through a combination of good design, careful operation, and adequate isolation and containment, the public would not be expected to be harmed by such events. This report, which may be submitted as a whole or in several parts, must contain, when it is complete, all known information concerning the safety or hazard of the reactor. It is a public document, available for public inspection in the Commission public document room.

This publicly available report of the applicant's evaluation of the safety of his reactor is the basis for the safety determination which the Commission must make prior to issuance of a facility license.

The Division of Civilian Application, which has staff responsibility for analyzing the report and making safety recommendations to the Commission, may call upon various experts and specialists, both within and outside the Commission organization, for such specific or general advice as is needed in any given case. When all facets of the case have been reviewed and analyzed, and when the judgment and opinion of the experts have been assimilated, a notice of the Commission's intent to issue or deny the license, accompanied by a memorandum of consideration is published in the Federal Register. This memorandum is prepared taking into consideration all the facts, opinions, and judgments, and gives an analysis and discussion of the safety aspects and factors of uncertainty. If no petitions for intervention are filed pursuant to such notice, final action is taken in the case.

Among the experts who are consulted by the AEC in the course of its review and analysis of the Hazards Summary report is the Commission's Advisory Committee on Reactor Safeguards. This Committee is composed of persons who have fulltime responsibilities in the educational and industrial world. It provides the Commission with an opportunity to obtain benefit of the experience and judgment of many experts, having diversified talent, who are not available to the Commission on a full-time basis. We seek their advice on general policy matters relating to reactor safety. In addition, specific cases involving large reactors or involving unusual or special hazards problems are referred to the Committee for advice. In such cases the Committee's comments and recommendations are submitted in writing to the General Manager following a discussion at a meeting of the Committee.

The Committee has always used the limited time available to its members to deal with vital points and to prepare concise comments and recommendations which presuppose an intimate knowledge of the reactor under consideration. These comments and recommendations are prepared for use by the Commission's technical staff members who are familiar with all facets of the reactor. For this reason they often do not deal with many essential points which are pertinent to the safe operation of the reactor, but which are either so well understood or covered in other ways as to make specific mention unnecessary.

The reports submitted to the Commission by the ACRS are not reports in the generally understood sense of the term. They are not, and are not intended to be, thorough analyses of reactors, or of problems presented by them, or of the reasons why a permit or license should or should not be issued. The reports are designed in most cases rather to convey specific ideas, questions, or recommendations which the Committee wishes to communicate to the Commission and its staff for their evaluation and, where needed, investigation.

To require publication of these reports would frustrate some of the principal advantages of this kind of advisory committee. A principal part of its value to the Commission lies in the frankness and informality of the thoughts and suggestions they can tentatively express in their meetings and their reports. These reports are internal documents that are prepared for use by the Commission and its staff, in conjunction with such advice as may be obtained from other sources, in arriving at an overall judgment of the safety aspects of the reactor.

The consideration of the publication of internal documents of the Commission, including the comments and recommendations of the Advisory Committee on Reactor Safeguards is dealt with at some length in our letter of January 2, 1957, to Senator Anderson. We feel that the reasons which we gave in that letter for declining to make available certain internal memoranda and reports are still valid. In the January 2, 1957, letter we said in part:

"These are working papers which were prepared for internal use and which contain the views and opinions of members of the Commission's staff and its advisers. The Joint Committee's request, therefore, raises the issue of whether the Commission should depart from the long established constitutional position of the executive branch—a position restated by President Eisenhower in his letter of May 17, 1954, to the Secretary of Defense, in these words: '* * * it is essential to efficient and effective administration that employees of the executive branch be in a position to be completely candid in advising with each other on official matters, and * * * it is not in the public interest that any of their conversations or communications, or any documents or reproductions, concerning such advice be disclosed * * *'

"The reasons underlying the policy are clear. To subject the day-to-day judgment and advice of AEC employees or consultants to scrutiny by Congress or the public, for example, might well result in inhibiting the sources of advice that the Commission find essential to the proper exercise of its responsibilities.

Certainly the Joint Committee will appreciate our position since committees of Congress would find it difficult to carry out their legislative activities if the internal conversations and communications of their committee staffs were subjected to public scrutiny. Neither employees of the Joint Committee nor ours have the final responsibility for action and thus there is no reason for their views and advice to be subjected to possible public criticism. To do so might only have the unfortunate result of their disinclination to freely express themselves."

4. Information and Comments on Status of AEC Regulations and Policies Which Would Establish Criteria as to the Location and Other Safety Arrangements With Respect to Reactor Hazards

The safety of a reactor is dependent upon the interrelated effects of design, operating procedure, supervision, containment and location. No one of these factors is of overriding importance and no one can be considered alone.

Even the factor of location is closely related to the other aspects of reactor safety. For example, the location and acceptable size of a reactor site are not factors that can be considered alone. The adequacy of the site depends on such factors as the power level, control systems, safety systems, utilization of operating procedures, fuel design, coolant pressures, backup cooling, etc. (which determine the probability of occurrence of an accident and the magnitude of the energy release from the maximum credible accident) and on the containment structure.

We apply the general criterion that a given site is considered acceptable only if, after analysis of the reactor design and operating procedure to determine the nature and magnitude of the maximum credible accident, it is concluded that the proposed reactor housing can be reasonably expected to contain the fission products released by the maximum credible accident to a degree that would prevent overexposure to the public at the nearest site boundary.

As we have previously advised the Committee, the Commission has adopted a cautious, deliberate approach to the issuance of detailed criteria. Almost every application for facility license has presented new problems or required the reconsideration of problems in new contexts. In our consideration of these problems, we have attempted to bring to bear the best critical judgment we can rather than to apply any rules of thumb. We have not yet reached the stage where there are rules of thumb which can be applied to the hazards evaluation of reactors.

Although there are no codes or formulas which can be relied on, we can identify a good many elements or factors which must be evaluated in consideration of the safety aspects of reactors. We can, also, in the case of some of these factors provide general guides against which we attempt to evaluate the pertinent information available for the particular reactor. Not all of such factors would require consideration in connection with every reactor, and the general guides stated for these factors might need to be revised or modified in connection with particular reactors.

A start in the publication of these factors and guides was made with the issuance of the Commission's regulations in part 50, 10 Code of Federal Regulations, "Licensing of Production and Utilization Facilities." Section 50.34 requires that applications include information as to the processes to be performed, materials to be produced and effluents to be discharged; a complete description of the proposed facility; information as to the proposed site; and a description of proposed operating procedures and emergency procedures. It requires applicants also to submit an evaluation of measures and devices to prevent accidents which would create radioactive hazards and of measures and devices to protect against the consequences of such accidents should they occur. A copy of this regulation is attached.

In addition, the regulation contains a statement of the basic criterion which must be met before the Commission will allow the operation of a reactor; namely, that there is reasonable assurance that the health and safety of the public will not be endangered.

We have also developed and published standards for protection against radiation, which must be observed in the routine operation of licensed reactors. Against these standards, published as part 20 of the Commission's regulations (10 C. F. R.), we evaluate measures to protect reactor employees and the public against overexposure to radiation. A copy of this regulation is attached.

Injury to people and property in areas surrounding the site of a nuclear facility cannot occur unless fission products or direct radiation are released from the

facility into those areas. In evaluating whether there is sufficiently low probability that mishap or malfunction resulting in such release could occur, a variety of factors must be considered, among others:

1. *Fission products which might be generated.*—For example, fission product inventories in any fuel element change drastically as to quantity and character depending on the power-operation history for that element. Some fission products are more hazardous than others.

2. *Features of the core affecting the release of fission products in a mishap.*—For example, if the fuel is a liquid and a break in the system should occur, the volatile fission products would be easily released, unless suitable protection is provided. If the fuel is a solid of some type and if it is further enclosed in a metal cladding, these features provide additional defenses against release if an accident should occur. The temperature at which fuel elements customarily operate with respect to the melting point of those elements is quite pertinent to safety because this determines the magnitude of the power rise which would have to occur in order to melt the fuel elements and thus release the volatile portions of the fission products.

3. *The nuclear characteristics of the assembly.*—For example, the neutron lifetime may be importantly related to the rapidity with which power surges would result if steady operation should be perturbed and hence determines the speed with which mechanical safety devices must operate in order to prevent excessive power level when surges occur.

4. *Temperature coefficient.*—The nature of the temperature coefficient of reactivity is also important in evaluating the stability of performance of a reactor. Existence of a rapidly acting positive temperature coefficient would be cause for great concern unless unusually dependable and extensive offsetting safety characteristics were also present in the system.

5. *Safeguards against accidents.*—For example, in addition to such inherent stability as the reactor might possess, mechanical, electrical, or other physical interlocks and safety devices must usually be provided to furnish adequate means of control.

6. *Containment.*—As mentioned above, in any populated area a suitable combination of site dimensions and reactor containment must be provided to the degree necessary to protect people and property in surrounding areas against the remote possibility that all safeguards might fail and fission products might be released from the reactor assembly itself.

The further development of our facility licensing regulations will essentially be a process of elaborating on and making more specific the elements which are now identified in the regulation; and making more specific the very general criterion presently stated in the regulation. Our experience during the 15 months that part 50 has been in effect has been enormously helpful to us for this purpose. We expect that before the end of this year proposed amendments to the regulation may be issued for public comment further defining those elements and criteria.

[Reprinted from Federal Register, January 19, 1956]

TITLE 10—ATOMIC ENERGY

CHAPTER I—ATOMIC ENERGY COMMISSION

PART 50—LICENSING OF PRODUCTION AND UTILIZATION FACILITIES

Effective 30 days after publication in the Federal Register, Part 50, 10 CFR, "Control of Facilities for the Production of Fissionable Material," is hereby amended to read as follows:

GENERAL PROVISIONS

Sec.
50.1 Basis and purpose.
50.2 Definitions.
50.3 Interpretations.

REQUIREMENT OF LICENSE, EXCEPTIONS

50.10 License required.
50.11 Exceptions and exemptions from license.
50.12 Specific exemptions.

CLASSIFICATION AND DESCRIPTION OF LICENSES

Sec.
50.20 Two classes of licenses.
50.21 Class 104 licenses; for medical therapy and research and development facilities.
50.22 Class 103 licenses; for commercial and industrial facilities.
50.23 Construction permits.

APPLICATIONS FOR LICENSES, FORM, CONTENTS, INELIGIBILITY OF CERTAIN APPLICANTS

50.30 Applications for licenses, oath or affirmation.
50.31 Combining applications.
50.32 Elimination of repetition.
50.33 Contents of applications; general information.
50.34 Contents of applications; technical information hazards summary report.
50.35 Extended time for providing technical information.
50.36 Designation of technical specifications.
50.37 Agreement limiting access to Restricted Data.
50.38 Ineligibility of certain applicants.
50.39 Public inspection of applications.

STANDARDS FOR LICENSES AND CONSTRUCTION PERMITS

50.40 Common standards.
50.41 Additional standards for class 104 licenses.
50.42 Additional standards for class 103 licenses.
50.43 Additional standards and provisions affecting class 103 licenses for commercial power.
50.44 Standards for licenses authorizing export only.
50.45 Standards for construction permits.

ISSUANCE, LIMITATIONS, AND CONDITIONS OF LICENSES AND CONSTRUCTION PERMITS

50.50 Issuance of licenses and construction permits.
50.51 Duration of license, renewal.
50.52 Combining licenses.
50.53 Jurisdictional limitations.
50.54 Conditions of licenses.
50.55 Conditions of construction permits.
50.56 Conversion of construction permit to license; or amendment of license.

ALLOCATION OF SPECIAL NUCLEAR MATERIAL

50.60 Allocation of special nuclear material.

INSPECTIONS, RECORDS, REPORTS

50.70 Inspections.
50.71 Maintenance of records, making of reports.

TRANSFER OF LICENSEES-CREDITORS' RIGHTS; SURRENDER OF LICENSES

[§§50.80 to 50.89 reserved]

AMENDMENT OF LICENSE OR CONSTRUCTION PERMIT AT REQUEST OF HOLDER

50.90 Application for amendment of license or construction permit.
50.91 Issuance of amendment.

REVOCATION, SUSPENSION, MODIFICATION, AMENDMENTS OF LICENSES AND CONSTRUCTION PERMITS, EMERGENCY OPERATIONS BY THE COMMISSION

50.100 Revocation, suspension, modification of licenses and construction permits for cause.
50.101 Retaking possession of special nuclear material.
50.102 Commission operation after revocation.
50.103 Suspension and operation in war or national emergency.

ENFORCEMENT

50.110 Violations.

AUTHORITY: §§ 50.1 to 50.110 issued under sec. 103, 68 Stat. 936, sec. 104, 68 Stat. 937, sec. 161, 68 Stat. 948, sec. 182, 68 Stat. 953, sec. 183, 68 Stat. 954; 42 U. S. C. 2133, 2134, 2201, 2232, 2233. For the purposes of sec. 223, 68 Stat. 958; 42 U. S. C. 2273, § 50.54 (i) issued under sec. 1611, 68 Stat. 949; 42 U. S. C. 2201, and §§ 50.70 to 50.71 issued under sec. 161p, 68 Stat. 950; 42 U. S. C. 2201.

GENERAL PROVISIONS

§ 50.1 *Basis purpose, and procedures applicable.* The regulations in this part are promulgated by the Atomic Energy Commission, pursuant to the Atomic Energy Act of 1954 (68 Stat. 919), to provide for the licensing of production and utilization facilities.

§ 50.2 *Definitions.* As used in this part,

(a) "Production facility" means:

(1) Any nuclear reactor designed or used primarily for the formation of plutonium or uranium 233; or

(2) Any facility designed or used for the separation of the isotopes of uranium or the isotopes of plutonium, except laboratory scale facilities designed or used for experimental or analytical purposes only; or

(3) Any facility designed or used for the processing of irradiated materials containing special nuclear material, except laboratory scale facilities designed or used for experimental or analytical purposes only.

(b) "Utilization facility" means any nuclear reactor other than one designed or used primarily for the formation of plutonium or U–233.

NOTE: Pursuant to sections 11p and 11v, respectively, of the Act, the Commission may from time to time add to, or otherwise alter, the foregoing definitions of production and utilization facility. It may also include as a facility an important component part especially designed for a facility, but has not at this time included any component parts n the definitions.

(c) "Act" means the Atomic Energy Act of 1954 (68 Stat. 919) including any amendments thereto.

(d) "Agreement for cooperation" means any agreement with another nation or regional defense organization, authorized or permitted by sections 54, 57, 64, 82, 103, 104, or 144 of the act, and made pursuant to section 123 of the act.

(e) "Atomic energy" means all forms of energy released in the course of nuclear fission or nuclear transformation.

(f) "Atomic weapon" means any device utilizing atomic energy, exclusive of the means for transporting or propelling the device (where such means is a separable and divisible part of the device), the principal purpose of which is for use as, or for development of, a weapon, a weapon prototype, or a weapon test device.

(g) "By-product material" means any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material.

(h) "Commission" means the Atomic Energy Commission or its duly authorized representatives.

(i) "Common defense and security" means the common defense and security of the United States.

(j) "Government agency" means any executive department, commission, independent establishment, corporation, wholly or partly owned by the United States of America which is an instrumentality of the United States, or any board, bureau, division, service, office, officer, authority, administration, or other establishment in the executive branch of the Government.

(k) "Nuclear reactor" means an apparatus, other than an atomic weapon, designed or used to sustain nuclear fission in a self-supporting chain reaction.

(l) "Person" means (1) any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, Government agency other than the Commission, any State or any political subdivision of, or any political entity within a State, any foreign government or nation or any political subdivision of any such government or nation, or other entity; and (2) any legal successor, representative, agent, or agency of the foregoing.

(m) "Produce," when used in relation to special nuclear material, means (1) to manufacture, make, produce, or refine special nuclear material; (2) to separate special nuclear material from other substances in which such material may be contained; or (3) to make or to produce new special nuclear material.

(n) "Research and development" means (1) theoretical analysis, exploration, or experimentation; or (2) the extension of investigative findings and theories of a scientific or technical nature into practical application for experimental and demonstration purposes, including the experimental production and testing of models, devices, equipment, materials, and processes.

(o) "Restricted Data" means all data concerning (1) design, manufacture, or utilization of atomic weapons; (2) the production of special nuclear material; or (3) the use of special nuclear material in the production of energy, but shall not include data declassified or removed from the Restricted Data category pursuant to section 142 of the act.

(p) "Source material" means source material as defined in section 11s of the act and in the regulations contained in Part 40 of this chapter.

(q) "Special nuclear material" means (1) plutonium, uranium 233, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Commission, pursuant to the provisions of section 51 of the act, determines to be special nuclear material, but does not include source material; or (2) any material artificially enriched by any of the foregoing, but does not include source material.

(r) "United States," when used in a geographical sense, includes all Territories and possessions of the United States, the Canal Zone, and Puerto Rico.

§ 50.3 *Interpretations.* Except as specifically authorized by the Commission in writing, no interpretation of the meaning of the regulations in this part by any officer or employee of the Commission other than a written interpretation by the General Counsel will be recognized to be binding upon the Commission.

REQUIREMENT OF LICENSE, EXCEPTIONS

§ 50.10 *License required.* Except as provided in § 50.11, no person within the United States shall transfer or receive in interstate commerce, manufacture, produce, transfer, acquire, possess, use, import, or export any production or utilization facility except as authorized by a license issued by the Commission.

§ 50.11 *Exceptions and exemptions from license.* Nothing in this part shall be deemed to require a license for:

(a) The manufacture, production, or acquisition by the Department of Defense of any utilization facility authorized pursuant to section 91 of the act, or the use of such facility by the Department of Defense or by a person under contract with and for the account of the Department of Defense;

(b) The processing, fabricating, or refining of special nuclear material, or the separation of special nuclear material, or the separation of special nuclear material from other substances, under contract with and for the account of the Commission:

(c) The construction or operation of production or utilization facilities under contract with and for the account of the Commission; or

(d) The transportation or possession of any production or utilization facility by a common or contract carrier or warehouseman in the regular course of carriage for another or storage incident thereto.

§ 50.12 *Specific exemptions.* The Commission may, upon application by any interested person, grant such exemptions from the requirements of the regulations in this part as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest.

CLASSIFICATION AND DESCRIPTION OF LICENSES

§ 50.20 *Two classes of licenses.* Licenses will be issued to named persons applying to the Commission therefor, and will be either class 104 or class 103.

§ 50.21 *Class 104 licenses; for medical therapy and research and development facilities.* A class 104 license will be issued, to an applicant who qualifies, for any one or more of the following: to transfer or receive in interstate commerce, manufacture, produce, transfer, acquire, possess, use, import, or export under the terms of an agreement for cooperation:

(a) A utilization facility for use in medical therapy; or

(b) A production or utilization facility involved in the conduct of research and development activities leading to the demonstration of the practical value of the facility for industrial or commercial purposes; or

(c) A production or utilization facility, which is useful in the conduct of research and development activities of the types specified in section 31 of the act, and which is not a facility of the type specified in subparagraph (b) of this section.

§ 50.22 *Class 103 licenses; for commercial and industrial facilities.* A class 103 license will be issued, to an applicant who qualifies, for any one or more of the following: to transfer or receive in interstate commerce, manufacture, produce, transfer, acquire, possess, use, import, or export under the terms of an agreement for cooperation, a production or utilization facility which is of a type found in writing by the Commission, to have been sufficiently developed to be of practical value for industrial or commercial purposes.

§ 50.23 *Construction permits.* A construction permit for the construction of a production or utilization facility will be issued prior to the issuance of a license if the application is otherwise acceptable, and will be converted upon due completion of the facility and Commission action into a license as provided in § 50.56. A construction permit for the alteration of a production or utilization factility will be issued prior to the issuance of an amendment of a license, if the application for amendment is otherwise acceptable, as provided in §50.91.

APPLICATIONS FOR LICENSES, FORM, CONTENTS, INELIGIBILITY OF CERTAIN APPLICANTS

§ 50.30 *Applications for licenses, oath or affirmation.* Each application for a license, including whenever appropriate a construction permit, should be filed in sextuplicate with the Commission at 1901 Constitution Avenue, Washington 25, D. C., Attention: Division of Civilian Application. Each application shall be signed by the applicant or duly authorized officer thereof under oath or affirmation.

§ 50.31 *Combining applications.* An applicant may combine in one his several applications for different kinds of licenses under the regulations in this chapter.

§ 50.32 *Elimination of repetition.* In his application, the applicant may incorporate by reference information contained in previous applications, statements or reports filed with the Commission: *Provided*, That such references are clear and specific.

§ 50.33 *Contents of applications; general information.* Each application shall state:

(a) Name of applicant:

(b) Address of applicant;

(c) Description of business or occupation of applicant;

(d) (1) If applicant is an individual, state citizenship.

(2) If applicant is a partnership, state name, citizenship and address of each partner and the principal location where the partnership does business.

(3) If applicant is a corporation or an unincorporated association, state:

(i) The state where it is incorporated or organized and the principal location where it does business;

(ii) The names, addresses and citizenship of its directors and of its principal officers;

(iii) Whether it is owned, controlled, or dominated by an alien, a foreign corporation, or foreign government, and if so, give details.

(4) If the applicant is acting as agent or representative of another person in filing the application, identify the principal and furnish information required under this paragraph with respect to such principal.

(e) The class of license applied for, the use to which the facility will be put, the period of time for which the license is sought, and a list of other licenses, except operator's licenses, issued or applied for in connection with the proposed facility.

(f) The financial qualifications of the applicant to engage in the proposed activities in accordance with the regulations in this chapter. If the application is also for special nuclear material license pursuant to the regulations in Part 70 of this chapter, information should be included with respect to the applicant's financial qualifications to assume responsibility for the payment of Commission charges for special nuclear material.

(g) The technical qualifications of the applicant to engage in the proposed activities in accordance with the regulations in this chapter.

(h) If the applicant proposes to construct or alter a production or utilization facility, the application shall state the earliest and latest dates for completion of the construction or alteration.

(i) If the proposed activity is the generation and distribution of electric energy under a class 103 license, a list of the names and addresses of such regulatory agencies as may have jurisdiction over the rates and services of the proposed activity, and of those municipalities, private utilities, public bodies, and cooperatives, which are within transmission distance and which are authorized to engage in the distribution of electric energy within the area.

(j) If the application contains Restricted Data or other defense information, it shall be prepared in such manner that all Restricted Data and other defense information are separated from the unclassified information.

§ 50.34 *Contents of applications; technical information hazards summary report.* Each application shall state the following technical information:

(a) A description of the chemical, physical, metallurgical, or nuclear process to be performed, and a statement of the kind and quantity of any radioactive effluent expected to result from the process. The description of the process should be sufficiently detailed to permit evaluation of the radioactive hazards involved. The magnitude of the proposed operation should be indicated in terms of the amount and radioactivity of source, special nuclear, or by-product material to be handled per unit of time, and thermal power to be generated if any.

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(b) A description of the facility. The description should be based on the design criteria for the facility as a whole and for those major component parts which are essential to the safe operation of the facility, and should be presented in sufficient detail to allow an evaluation of the adequacy of the various means proposed to minimize the probability of danger from radioactivity to persons both on and off-site. The description should also cover any activities, other than those subject to license, proposed to be carried on in the building which will house the facility and on the balance of the site.

(c) A description of the site on which the facility is to be located. This should include a map of the area showing the location of the site and indicating the use to which the surrounding land is put, i. e., industrial, commercial, agricultural, residential; location of sources of potable or industrial water supply, watershed areas and public utilities; and a scale plot plan of the site showing the proposed location of the facility.

(d) A description of proposed procedures for: routine and nonroutine operations, startup and shutdown, maintenance, storage, training of employees, minimizing operational mishaps (such as locked controls, checklists, and close supervision), investigating unusual or unexpected incidents; and a description of such other details as may be useful in evaluating the existence and effectiveness of safeguards against the radioactive hazards in the operation of the facility.

(e) A description of plans or proposals in the event that acts or accidents occur which would create radioactive hazards. The description should relate the various operational procedures, the protective devices, and the pertinent features of the site, to such happenings as operational mistakes, equipment or instrument failure or malfunction, fire, electric power failure, flood, earthquake, storm, strike, and riot.

(f) Meterological, hydrological, geological, and seismological data necessary for evaluating the measures proposed for protecting the public against possible radioactive hazards.

(g) An evaluation of the proposed measures and devices to prevent acts or accidents which would create radioactive hazards or to protect against the consequences should such acts or accidents occur.

(h) A description of procedures for disposal of radioactive solid waste and the final disposal of liquid waste effluent.

(i) A description of means provided to sample atmosphere discharges through stacks where such stacks may emit byproduct material or special nuclear material.

§ 50.35 *Extended time for providing technical information.* Where, because of the nature of a proposed project, an applicant is not in a position to supply initially all of the technical information otherwise required to complete the application, he shall indicate the reason, the items or kinds of information omitted, and the approximate times when such data will be produced. If the Commision is satisfied that it has information sufficient to provide reasonable assurance that a facility of the general type proposed can be constructed and operated at the proposed location without undue risk to the health and safety of the public and that the omitted information will be supplied, it may process the application and issue a construction permit on a provisional basis without the omitted information subject to its later production and an evaluation by the Commission that the final design provides reasonable assurances that the health and safety of the public will not be endangered.

§ 50.36 *Designation of technical specifications.* (a) The Commission will indicate, by notice to the applicant, which of the provisions of his hazards summary report or any supplement thereto will be deemed to be technical specifications that become part of the license or construction permit. In giving such notice, the Commission will afford the applicant reasonable opportunity to amend or revise the technical information supplied before proceeding further to process the application.

(b) The Commission may require the applicant to designate those provisions of his hazards summary report or any supplement thereto, which he proposes be incorporated as technical specifications in the construction permit or license.

§ 50.37 *Agreement limiting access to Restricted Data.* As part of his application and in any event prior to the receipt of Restricted Data or the issuance of a license or construction permit, the applicant shall agree in writing that he will not permit any individual to have access to Restricted Data until the Civil Service Commission shall have made an investigation and report to the Commission on the character, associations, and loyalty of such individual, and the Commission

shall have determined that permitting such person to have access to Restricted Data will not endanger the common defense and security. The agreement of the applicant in this regard shall be deemed part of the license or construction permit, whether so stated therein or not.

§ 50.38 *Ineligibility of certain applicants.* Any person who is a citizen, national, or agent of a foreign country, or any corporation, or other entity which the Commission knows or has reason to believe is owned, controlled, or dominated by an alien, a foreign corporation, or a foreign government, shall be ineligible to apply for and obtain a license except a license authorizing export only pursuant to an agreement for cooperation.

§ 50.39 *Public inspection of applications.* Applications and documents submitted to the Commission in connection with applications may be made available for public inspection in accordance with the provisions of the regulations contained in Part 2 of this chapter.

STANDARDS FOR LICENSES AND CONSTRUCTION PERMITS

§ 50.40 *Common standards.* In determining that a license will be issued to an applicant, the Commission will be guided by the following considerations:

(a) The processes to be performed, the operating procedures, the facility and equipment, the use of the facility, and other technical specifications, or the proposals in regard to any of the foregoing collectively provide reasonable assurance that the applicant will comply with the regulations in this chapter, including the regulations in Part 20, and that the health and safety of the public will not be endangered.

(b) The applicant is technically and financially qualified to engage in the proposed activities in accordance with the regulations in this chapter.

(c) The issuance of a license to the applicant will not, in the opinion of the Commission, be inimical to the common defense and security or to the health and safety of the public.

§ 50.41 *Additional standards for class 104 licenses.* In determining that a class 104 license will be issued to an applicant, the Commission will, in addition to applying the standards set forth in § 50.40 be guided by the following considerations.

(a) The Commission will permit the widest amount of effective medical therapy possible with the amount of special nuclear material available for such purposes.

(b) The Commission will permit the conduct of widespread and diverse research and development.

(c) In the event that applications for special nuclear material for use in activities licensed by the Commission pursuant to section 104b of the act exceed the amount of special nuclear material available the Commission will give priority to those activities which will, in the opinion of the Commission, lead to major advances in the application of atomic energy for industrial purposes.

NOTE: The Commission has determined, in accordance with section 140b of the Atomic Energy Act of 1954, that the regulations and terms of license applicable to a production or utilization facility in the conduct of research and development activities leading to the demonstration of practical value of such facility for industrial or commercial purposes are compatible with the regulations and terms of licenses which will apply in the event that a class 103 license were later to be issued for that type of facility.

§ 50.42 *Additional standards for class 103 licenses.* In determining whether a class 103 license will be issued to an applicant, the Commission will, in addition to applying the standards set forth in § 50.40, be guided by the following considerations:

(a) The proposed activities will serve a useful purpose proportionate to the quantities of special nuclear material or source material to be utilized.

(b) Due account will be taken of the advice provided by the Attorney General, pursuant to subsection 105c of the act. For this purpose, before issuing the license, the Commission will notify the Attorney General of the proposed license, and the terms and conditions thereof, and request the advice of the Attorney General as to whether or not the proposed license would tend to create or maintain a situation inconsistent with the antitrust laws, as specified in subsection 105a of the act: *Provided,* That this requirement will not apply with respect to the types of class 103 licenses which the Commission, with the approval of the Attorney General, may determine would not significantly affect the applicant's activities under the antitrust laws. Upon receipt of the Attorney General's advice, the Commission will cause such advice to be published in the Federal Register.

§ 50.43 *Additional standards and provisions affecting class 103 licenses for commercial power.* In addition to applying the standards set forth in §§ 50.40 and 50.42, in the case of a class 103 license for a facility for the generation of commercial power:

(a) The Commission will give notice in writing of each application of such regulatory agency as may have jurisdiction over the rates and services of the proposed activity, and to municipalities, private utilities, public bodies, and cooperatives which are within transmission distance and which are authorized to engage in distribution of electric energy; and the Commission will publish notice of the application once each week for four consecutive weeks in the Federal Register. No license will be issued by the Commission prior to the giving of such notices and until four weeks after the last publication in the Federal Register.

(b) If there are conflicting applications for a limited opportunity for such license, the Commission will give preferred consideration in the following order: First, to applications submitted by public or cooperative bodies for facilities to be located in high cost power areas in the United States; second, to applications submitted by others for facilities to be located in such areas; third, to applications submitted by public or cooperative bodies for facilities to be located in other than high cost power areas, and, fourth, to all other applicants.

(c) The licensee who transmits electric energy in interstate commerce, or sells it at wholesale in interstate commerce, shall be subject to the regulatory provisions of the Federal Power Act.

(d) Nothing herein shall preclude any government agency, now or hereafter authorized by law to engage in the production, marketing, or distribution of electric energy, if otherwise qualified, from obtaining a license for the construction and operation of a utilization facility for the primary purpose of producing electric energy for disposition for ultimate public consumption.

§ 50.44 *Standards for licenses authorizing export only.* Where a license is sought solely to authorize the export of production or utilization facilities, the Commission will determine whether the issuance of the license to the applicant for the facility involved is within the scope of and consistent with the terms of an agreement for cooperation with the nation to which the facility is to be exported.

§ 50.45 *Standards for construction permits.* An applicant for a license or an amendment of a license who proposes to construct or alter a production or utilization facility will be initially granted a construction permit, if the application is in conformity with and acceptable under the criteria of §§ 50.31 through 50.38 and the standards of §§ 50.40 through 50.43.

ISSUANCE, LIMITATIONS, AND CONDITIONS OF LICENSES AND CONSTRUCTION PERMITS

§ 50.50 *Issuance of licenses and construction permits.* Upon determination that an application for a license meets the standards and requirements of the act and regulations, and that notifications, if any, to other agencies or bodies have been duly made, the Commission will issue a license, or if appropriate a construction permit, in such form and containing such conditions and limitations including technical specifications, as it deems appropriate and necessary.

§ 50.51 *Duration of license, renewal.* Each license will be issued for a fixed period of time to be specified in the license but in no case to exceed 40 years from the date of issuance. Where the operation of a facility is involved, the Commission will issue the license for the term requested by the applicant or for the estimated useful life of the facility if the Commission determines that the estimated useful life is less than the term requested. Where construction of a facility is involved, the Commission may specify in the construction permit the period for which the license will be issued if approved pursuant to § 50.56. Licenses may be renewed by the Commission upon the expiration of the period.

§ 50.52 *Combining licenses.* The Commission may combine in a single license the activities of an applicant which would otherwise be licensed severally.

§ 50.53 *Jurisdictional limitations.* No license under this part shall be deemed to have been issued for activities which are not under or within the jurisdiction of the United States except insofar as the export of production or utilization facilities is authorized.

§ 50.54 *Conditions of licenses.* Whether stated therein or not, the following shall be deemed conditions in every license issued:

(a) Title to all special nuclear material utilized or produced by facilities pursuant to the license shall at all times be in the United States.

(b) No right to the special nuclear material shall be conferred by the license except as may be defined by the license.

(c) Neither the license, nor any right thereunder, nor any right to utilize or produce special nuclear material shall be transferred, assigned, or disposed of in any manner, either voluntarily or involuntarily, directly or indirectly, through transfer of control of the license to any person, unless the Commission shall, after securing full information, find that the transfer is in accordance with the provisions of the act and give its consent in writing.

(d) The license shall be subject to suspension and to the rights of recapture of the material or control of the facility reserved to the Commission under section 108 of the act in a state of war or national emergency declared by Congress.

(e) The license shall be subject to revocation, suspension, modification, or amendment for cause as provided in the act and regulations, in accordance with the procedures provided by the act and regulations.

(f) The licensee will at any time before expiration of the license, upon request of the Commission submit written statements, signed under oath or affirmation, to enable the Commission to determine whether or not the license should be modified, suspended, or revoked.

(g) The issuance or existence of the license shall not be deemed to waive, or relieve the licensee from compliance with, the antitrust laws, as specified in subsection 105a of the act. In the event that the licensee should be found by a court of competent jurisdiction to have violated any provision of such antitrust laws in the conduct of the licensed activity, the Commission may suspend or revoke the license or take such other action with respect to it as shall be deemed necessary.

(h) The license shall be subject to the provisions of the act now or hereafter in effect and to all rules, regulations, and orders of the Commission. The terms and conditions of the license shall be subject to amendment, revision, or modification, by reason of amendments of the act or by reason of rules, regulations, and orders issued in accordance with the terms of the act.

(i) The licensee shall not permit the manipulation of the controls of any production or utilization facility by anyone who is not a licensed operator as provided in Part 55 of this chapter.

(j) The licensee shall not, except as authorized pursuant to a construction permit, make any alteration in the facility constituting a change from the technical specifications previously incorporated in a license or construction permit pursuant to § 50.36.

§ 50.55 *Conditions of construction permits.* Each construction permit shall be subject to the following terms and conditions:

(a) The permit shall state the earliest and latest dates for completion of the construction or modification. If the construction or modification is completed before the earliest date specified, the holder of the permit shall promptly notify the Commission for the purpose of accelerating final inspection and any scheduled delivery of materials from the Commission.

(b) If the proposed construction or modification of the facility is not completed by the latest completion date, the permit shall expire and all rights thereunder shall be forfeited: *Provided, however,* That upon good cause shown the Commission will extend the completion date for a reasonable period of time. The Commission will recognize, among other things, developmental problems attributable to the experimental nature of the facility or fire, flood, explosion, strike, sabotage, domestic violence, enemy action, an act of the elements, and other acts beyond the control of the permit holder, as a basis for extending the completion date.

(c) Except as modified by this section, the construction permit shall be subject to the same conditions to which a license is subject.

(d) At or about the time of completion of the construction or modification of the facility, the applicant will file any additional information needed to bring the original application for license up to date.

§ 50.56 *Conversion of construction permit to license; or amendment of license.* Upon completion of the construction or alteration of a facility, in compliance with the terms and conditions of the construction permit and subject to any necessary testing of the facility for health or safety purposes, the Commission will, in the absence of good cause shown to the contrary issue a license of the class for which the construction permit was issued or an appropriate amendment of the license, as the case may be.

ALLOCATION OF SPECIAL NUCLEAR MATERIAL

§ 50.60 *Allocation of special nuclear material.* (a) In construction permits and licenses issued to applicants proposing to operate production or utilization facilities, the Commission may incorporate provisions designating the quantities of special nuclear material available for use by each such facility. Such provisions will normally be in the form of a statement that the Commission has allocated to the applicant, for use in connection with the operation of the particular facility involved, a designated quantity (or quantities) of special nuclear material. The statement will include an estimated schedule for a reasonable period of time of special nuclear material transfers to the applicant and of special nuclear material returns to the Commission.

(b) The request for incorporation of such provisions may be made simultaneously with the submission of an application for construction permit or facility license or at any time thereafter. Such request should be accompanied by at least the following information:

(1) The applicant's financial qualifications to assume responsibility for payment of Commission charges for the materials, and to undertake and carry out the proposed use of special nuclear material for a reasonable period time;

(2) The estimated date on which the applicant desires to receive the first shipment of special nuclear material and an estimated schedule, by years, for subsequent receipts;

(3) A schedule, by years, showing the estimated production, consumption and operating losses of special nuclear material; and

(4) An estimated schedule, by years, for the transfer of special nuclear material to the Commission or to other licenses.

Supporting data for the estimates required by subparagraphs (2), (3), and (4) of this paragraph shall be included.

(c) A request for the incorporation in a construction permit or license of provisions designating the amount of special material available for use by the facility will be approved by the Commission if:

(1) The quantities of special nuclear material are available for distribution under section 53 of the act; and

(2) The applicant appears to be financially qualified to assume responsibility for the payment of Commission charges for the material and to undertake and carry out the proposed use of special nuclear material for a reasonable period of time; and

(3) The estimated quantities and schedules submitted in response to paragraph (b) of this section are reasonable; and

(4) Approval of the request is consistent with the priority and preference provisions of the act, including sections 53f, 104b, and 182.

(d) The Commission may, in accordance with the procedures provided in Part 2 of this chapter, reduce the quantities of special nuclear material allocated to any permittee or licensee pursuant to this section, upon the ground that the quantities allocated exceed those reasonably required, or estimated to be required, for use by the facility involved. The expiration, revocation, or other termination of a construction permit or license shall terminate all allocations incorporated in such permit or license.

NOTE: Quantities of special nuclear material allocated pursuant to the provisions of this section will not be distributed to the licensee until needed. At the time the allocation is made, however, the Commission will make appropriate entries in its special nuclear material inventory and accounting records to reflect such allocation.

INSPECTION, RECORDS, REPORTS

§ 50.70 *Inspections.* Each licensee and each holder of a construction permit shall permit inspection, by duly authorized representatives of the Commission, of his records, premises, activities, and of licensed materials in possession or use, related to the license or construction permit as may be necessary to effectuate the purposes of the act, including section 105 of the act.

§ 50.71 *Maintenance of records, making of reports.* Each licensee and each holder of a construction permit shall maintain such records and make such reports, in connection with the licensed activity, as may be required by the conditions of the license or permit or by the rules, regulations, and orders of the Commission in effectuating the purposes of the act, including section 105 of the act.

TRANSFER OF LICENSES-CREDITORS' RIGHTS; SURRENDER OF LICENSES

[Sections 50.80 to 50.89 reserved]

AMENDMENT OF LICENSE OR CONSTRUCTION PERMIT AT REQUEST OF HOLDER

§ 50.90 *Application for amendment of license or construction permit.* Whenever a holder of a license or construction permit desires to amend the license or permit, application for an amendment shall be filed with the Commission, fully describing the changes desired, and following as far as applicable the form prescribed for original applications.

§ 50.91 *Issuance of amendment.* In determining whether an amendment to a license or construction permit will be issued to the applicant, the Commission will be guided by the considerations which govern the issuance of initial licenses or construction permits, to the extent applicable and appropriate. If the application involves the material alteration of a licensed facility, a construction permit will be issued prior to the issuance of the amendment to the license.

REVOCATION, SUSPENSION, MODIFICATION, AMENDMENT OF LICENSES AND CONSTRUCTION PERMITS, EMERGENCY OPERATIONS BY THE COMMISSION

§ 50.100 *Revocation, suspension, modification of licenses and construction permits for cause.* A license or construction permit may be revoked, suspended, or modified, in whole or in part, for any material false statement in the application for license or in the supplemental or other statement of fact required of the applicant; or because of conditions revealed by the application for license or statement of fact or any report, record, inspection, or other means, which would warrant the Commission to refuse to grant a license on an original application (other than those relating to §§ 50.51, 50.42 (a), and 50.43 (b)); or for failure to construct or operate a facility in accordance with the terms of the construction permit or license, provided that failure to make timely completion of the proposed construction or alteration of a facility under a construction permit shall be governed by the provisions of § 50.55 (b); or for violation of, or failure to observe, any of the terms and provisions of the act, regulations, license, permit, or order of the Commission.

§ 50.101 *Retaking possession of special nuclear material.* Upon revocation of a license, the Commission may immediately retake possession of all special nuclear material held by the licensee.

§ 50.102 *Commission operation after revocation.* Whenever the Commission finds that the public convenience and necessity, or the production program of the Commission, requires continued operation of a production or utilization facility, the license for which has been revoked, the Commission may, after consultation with the appropriate Federal or State regulatory agency having jurisdiction, order that possession be taken of such facility and that it be operated for a period of time as, in the judgment of the Commission, the public convenience and necessity or the production program of the Commission may require, or until a license for operation of the facility shall become effective. Just compensation shall be paid for the use of the facility.

§ 50.103 *Suspension and operation in war or national emergency.* (a) Whenever Congress declares that a state of war or national emergency exists, the Commission, if it finds it necessary to the common defense and security, may,

(1) Suspend any license it has issued.

(2) Order the recapture of special nuclear material distributed.

(3) Order the operation of any licensed facility.

(4) Order entry into any plant or facility in order to recapture special nuclear material or to operate the facility.

(b) Just compensation shall be paid for any damages caused by recapture of special nuclear material or by operation or any facility, pursuant to this section.

ENFORCEMENT

§ 50.110 *Violations.* An injunction or other court order may be obtained prohibiting any violation of any provision of the act or any regulation or order issued thereunder. Any person who wilfully violates any provision of the act or any regulation or order issued thereunder may be guilty of a crime and, upon

conviction, may be punished by fine or imprisonment or both, as provided by law.

NOTE: The reporting and recordkeeping requirements contained herein have been approved by the Bureau of the Budget in accordance with The Federal Reports Act of 1942.

Dated at Washington, D. C., this 12th day of January 1956.

K. E. FIELDS,
General Manager.

[F. R. Doc. 56–417; Filed, Jan. 10, 1956; 3:40 a. m.]

[Reprinted from Federal Register, November 30, 1956]

TITLE 10—ATOMIC ENERGY

CHAPTER I—ATOMIC ENERGY COMMISSION

PART 50—LICENSING OF PRODUCTION AND UTILIZATION FACILITIES

EFFECT OF FINDING OF PRACTICAL VALUE UPON LICENSES PREVIOUSLY ISSUED

This amendment to Title 10, CFR Part 50, "Licensing of Production and Utilization Facilities," is published for the purpose of adding § 50.24 *Effect of finding of practical value upon licenses previously issued*, to the regulation. Inasmuch as this amendment is designed to clarify existing regulations and not to effect any change in the Commission's procedures and requirements, the Atomic Energy Commission has found that general notice of proposed rule making and public procedure are unnecessary, and that good cause exists why the regulation should be made effective without the customary period of notice.

Title 10, Chapter I, Part 50, Code of Federal Regulations, entitled "Licensing of Production and Utilization Facilities," is hereby amended by adding the following section to follow § 50.23:

§ 50.24. *Effect of finding of practical value upon licenses previously issued.* The making of a finding of practical value pursuant to section 102 of the act will not be regarded by the Commission as grounds for requiring:

(a) The conversion to a Class 103 license of any Class 104 license prior to the date of expiration contained in the license; or

(b) The conversion to a Class 103 license of any construction permit, issued under section 104 of the act, prior to the date designated in the permit for expiration of the license.

(60 Stat. 755–775; 42 U. S. C. 1801–1819)

Dated at Washington, D. C., this 23rd day of November 1956.

For the Atomic Energy Commission.

K. E. FIELDS,
General Manager.

[F. R. Doc. 56–9830; Filed, Nov. 29, 1956, 8:53 a. m.]

[Reprinted from Federal Register, January 29, 1957]

TITLE 10—ATOMIC ENERGY

CHAPTER I—ATOMIC ENERGY COMMISSION

PART 20—STANDARDS FOR PROTECTION AGAINST RADIATION

In July 1955 the Commission issued for public comment a proposed regulation to establish general standards for protection of licensees, their employees, and the public against radiation hazards arising out of the possession or use of special nuclear, source, or byproduct material under license issued by AEC. In preparing the effective regulation published below, the Commission has had the benefit of numerous comments and suggestions received since publication of the proposed rules. A number of changes suggested by those comments have been incorporated in the following regulation.

The regulation establishes standards which must be followed in handling radioactive materials which are subject to the licensing authority of the Com-

mission and provides procedures whereby deviations from such standards may be authorized on a case-to-case basis. The regulation prescribes limits which govern exposure of personnel to radiation and concentrations of radioactive material, concentrations of radioactive material which may be discharged into air and water, and disposal of radioactive wastes. It also establishes certain precautionary procedures and administrative controls.

The standards established by this regulation will be found to agree substantially with those published by the National Committee on Radiation Protection in N. B. S. Handbook 52 "Maximum Permissible Amounts of Radioisotopes in the Human Body and Maximum Permissible Concentrations in Air and Water," and N. B. S. Handbook 59 "Permissible Dose from External Sources of Ionizing Radiation." The National Committee on Radiation Protection has under review recommendations to limit cumulative exposures over periods of years. The Commission is giving consideration to appropriate amendments to its regulations to deal with this cumulative exposure problem.

Limitations upon levels of radiation and concentrations of radioactive material in areas affected by but not controlled by the licensee are contained principally in § 20.102 ("Permissible Levels of Radiation in Unrestricted Areas"), § 20.103 ("Concentrations in Effluents to Unrestricted Areas"), and the sections on waste disposal. The sections are designed to assure that individuals in "unrestricted areas" do not receive exposure in excess of 10 percent of the limits established for persons exposed in restricted areas. For this purpose, the sections limit levels of radiation and concentrations of radioactive material which may be created in unrestricted areas by licensees, without special authorization from the AEC, to extremely low levels. These levels are believed to be sufficiently low to assure that there is no reasonable probability of individuals in unrestricted areas receiving exposures in excess of 10 percent of the permissible levels for restricted areas. Procedures are incorporated in those sections, however, under which the Commission may authorize licensees in specific cases to create higher levels in unrestricted areas where the circumstances of the particular case are such as to provide reasonable assurance that individuals in the unrestricted areas will not receive exposures in excess of 10 percent of the limitation established for restricted areas.

It is believed that the standards incorporated in these regulations provide, in accordance with present knowledge, a very substantial margin of safety for exposed individuals. It is believed also that the standards are practical from the standpoint of licensees. It should be emphasized that the standards are subject to change with the development of new knowledge, with significant increase in the average exposure of the whole population to radiation, and with further experience in the administration of the Commission's regulatory program.

Pursuant to the Administrative Procedures Act, Public Law 404, 79th Congress, 2d Session, the following rules are published as a document subject to codification to be effective 30 days after publication in the FEDERAL REGISTER.

GENERAL PURPOSES

Sec.
20.1 Purpose.
20.2 Scope.
20.3 Definitions.
20.4 Units of radiation dose.
20.5 Units of radioactivity.
20.6 Interpretations.
20.7 Communications.

PERMISSIBLE DOSES, LEVELS, AND CONCENTRATIONS

20.101 Exposure of individuals in restricted areas.
20.102 Permissible levels of radiation in unrestricted areas.
20.103 Concentrations in effluents to unrestricated areas.
20.104 Medical diagnosis, therapy, and research.
20.105 Measures to be taken after excessive exposures.

PRECAUTIONARY PROCEDURES

20.201 Surveys.
20.202 Personnel monitoring.
20.203 Caution signs, labels, and signals.
20.204 Exceptions from posting requirements.
20.205 Exemptions for radioactive materials packaged for shipment.
20.206 Instruction of personnel.
20.307 Storage of licensed material.

WASTE DISPOSAL

20.301 General requirement.
20.302 Method for obtaining approval of proposed disposal procedures.
20.303 Disposal by release into sanitary sewerage systems.
20.304 Disposal by burial in soil.

RECORDS, REPORTS, AND NOTIFICATION

Sec.
20.401 Records of surveys, radiation monitoring, and disposal.
20.402 Reports of theft or loss of licensed material.

EXCEPTIONS AND ADDITIONAL REQUIREMENTS

20.501 Applications for exemptions.
20.502 Additional requirements.

ENFORCEMENT

20.601 Violations.

AUTHORITY: §§ 20.1 to 20.601 issued under sec. 161 (b), 63 Stat. 948, 42 U. S. C. 2201.

GENERAL PROVISIONS

§ 20.1 *Purpose.* (a) The regulations in this part establish standards for protection against radiation hazards arising out of activities under licenses issued by the Atomic Energy Commission and are issued pursuant to the Atomic Energy Act of 1954 (68 Stat. 919).

(b) The use of radioactive material or other sources of radiation not licensed by the Commission is not subject to the regulations in this part. However, it is the purpose of the regulations in this part to control the possession, use, and transfer of licensed material by any licensee in such a manner that exposure to such material and to radiation from such material, when added to exposures to unlicensed radioactive material and to other unlicensed sources of radiation in the possession of the licensee, and to radiation therefrom, does not exceed the standards of radiation protection prescribed in the regulations in this part.

§ 20.2 *Scope.* The regulations in this part apply to all persons who receive, possess, use or transfer byproduct material, source material, or special nuclear material under a general or specific license issued by the Commission pursuant to the regulations in Part 30, 40, or 70 of this chapter.

§ 20.3 *Definitions.* (a) As used in this part:

(1) "Act" means the Atomic Energy Act of 1954 (68 Stat. 919) including any amendments thereto;

(2) "Airborne radioactive material" means any radioactive material dispersed in the air in the form of dusts, fumes, mists, vapors, or gases;

(3) "Byproduct material" means any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material;

(4) "Commission" means the Atomic Energy Commission or its duly authorized representatives;

(5) "Government agency" means any executive department, commission, independent establishment, corporation, wholly or partly owned by the United States of America which is an instrumentality of the United States, or any board, bureau, division, service, office, officer, authority, administration, or other establishment, in the executive branch of the Government;

(6) "Individual" means any human being;

(7) "Licensed material" means source material, special nuclear material, or byproduct material received, possessed, used, or transferred under a general or specific license issued by the Commission pursuant to the regulations in this chapter;

(8) "License" means a license issued under the regulations in Part 30, 40, or 70 of this chapter. "Licensee" means the holder of such license;

(9) "Person" means (i) any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, Government agency other than the Commission, any State, any foreign government or nation or any political subdivision of any such government or nations, or other entity; and (ii) any legal successor, representative, agent, or agency of the foregoing;

(10) "Radiation" means any or all of the following: alpha rays, beta rays, gamma rays, X-rays, neutrons, high-speed electrons, high-speed protons, and other atomic particles; but not sound or radio waves, or visible, infrared, or ultraviolet light;

(11) "Radioactive material" includes any such material whether or not subject to licensing control by the Commission;

(12) "Restricted area" means any area access to which is controlled by the licensee. "Restricted area" shall not include any areas used as residential quarters, although a separate room or rooms in a residential building may be set apart as a restricted area;

(13) "Source material" means any material except special nuclear material, which contains by weight one-twentieth of one percent (0.05 percent) or more of (i) uranium, (ii) thorium, or (iii) any combination thereof;

(14) "Special nuclear material" means (i) plutonium, uranium 233, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Commission, pursuant to the provisions of section 51 of the act, determines to be special nuclear material, but does not include source material; or (ii) any material artificially enriched by any of the foregoing but does not include source material;

(15) "Unrestricted area" means any area, entry into which is not controlled by the licensee, and any area used for residential quarters.

(b) Definitions of certain other words and phrases as used in this part are set forth in other sections, including:

(1) "Airborne radioactivity area" defined in § 20.203;

(2) "Radiation area" and "high radiation area" defined in § 20.202;

(3) "Personnel monitoring equipment" defined in § 20.202;

(4) "Survey" defined in § 20.201;

(5) Units of measurement of dose (rad, rem) defined in § 20.4;

(6) Units of measurement of radioactivity defined in § 20.5.

§ 20.4 *Units of radiation dose.* (a) "Dose," as used in this part, is the quantity of radiation absorbed, per unit of mass, by the body or by any portion of the body. When the regulations in this part specify a dose during a period of time, the dose means the total quantity of radiation absorbed, per unit of mass, by the body or by any portion of the body during such period of time. Several different units of dose are in current use. Definitions of units as used in this part are set forth in paragraphs (b) and (c) of this section.

(b) The rad, as used in this part, is a measure of the dose of any ionizing radiation to body tissues in terms of the energy absorbed per unit mass of the tissue. One rad is the dose corresponding to the absorption of 100 ergs per gram of tissue. (One millirad (mrad)=0.001 rad.)

(c) The rem, as used in this part, is a measure of the dose of any ionizing radiation to body tissue in terms of its estimated biological effect relative to a dose of one roentgen (r) of X-rays. (One millirem (mrem)=0.001 rem.) The relation of the rem to other dose units depends upon the biological effect under consideration and upon the conditions of irradiation. For the purpose of the regulations in this part, any of the following is considered to be equivalent to a dose of one rem:

(1) A dose of 1 r due to X—or gamma radiation;

(2) A dose of 1 rad due to X—, gamma, or beta radiation;

(3) A dose of 0.1 rad due to neutrons or high energy protons;

(4) A dose of 0.05 rad due to particles heavier than protons and with sufficient energy to reach the lens of the eye. If it is more convenient to measure the neutron flux, or equivalent, than to determine the neutron dose in rads, as provided in subparagraph (3) of this paragraph, one rem of neutron radiation may, for purposes of the regulations in this part, be assumed to be equivalent to 14 million neutrons per square centimeter incident upon the body; or, if there exists sufficient information to estimate with reasonable accuracy the approximate distribution in energy of the neutrons, the incident number of neutrons per square centimeter equivalent to one rem may be estimated from the following table:

Neutron energy	Number of neutrons per square centimeter equivalent to a dose of 1 rem
Thermal	960×10^6
0.0001 mev	480×10^6
0.01 mev	480×10^6
0.1 mev	96×10^6
0.5 mev	38×10^6
1 mev	29×10^6
2 mev	19×10^6
3 mev, and higher	14×10^6

§ 20.5 *Units of radioactivity.* (a) Radiactivity is commonly, and for purposes of the regulations in this part shall be, measured in terms of disintegrations per unit time or in curies. One curie (c)=3.7×10^{10} disintegrations per second (dps)=2.2×10^{12} disintegrations per minute (dpm). A commonly used submultiple of the curie is the microcurie (μc). One μc=0.000001 c=3.7×10^{4} dps=2.2×10^{6} dpm.

NOTE: Many radioistopes disintegrate into isotopes which are also radioactive. In expressing maximum permissible concentrations in air and water of these materials, as in Appendix B of this part, the activity stated is that of the parent isotope. In some cases, the fact that daughter products may contribute to the total dose has been taken into account in the determination of the maximum permissible concentration of the parent isotopes. In the tables of Appendix B of this part this is indicated by writing $Ba^{140}+La^{140}$, $Sr^{90}+Y^{90}$, $Rn^{222}+$dr, $Ra^{226}+\frac{1}{2}$ dr, etc.

EXAMPLE. In Column 1, Table I, Appendix B the maximum permissible concentration of Ba^{140} in air for occupational use is $2+10^{-7}\mu$c/ml. This is the maximum permissible concentration regardless of whether or not any of the La^{140} which may have resulted from the decay of the Ba^{140} is present or not. However, the value given for BA^{140} is less than it would be if La^{140} were a stable isotope, not only because of the possibility of La^{140} in the air but principally because, if the Ba^{140} is inhaled, its radioactive decay in the body will result in the production of La^{140} in the body.

(b) *Radon.* Airborne radioactivity of radon and its decay products may be determined by measurement of the activity of one or more decay products on dust filtered from the air. For purposes of the regulations in this part, the limit prescribed here will be considered to be met if the measured radioactivity of one or more decay products (for example, RaC′) does not exceed that which would result from the occurrence, at the time of sampling, of 1×10^{-7} microcuries, per milliliter of air, of Rn^{222} and each of its short-lived decay products, RaA, RaB, RaC, and RaC′. For this purpose, due allowance shall be made for changes in the radioactivity of the measured decay products from time of sampling through the period of measurement.

(c) *Natural uranium and natural thorium.* Natural uranium and natural thorium occur as mixtures of isotopes of the respective elements. In the case of uranium or of thorium, the number of microcuries shall be determined by dividing the total rate, in dpm, of alpha emissions from the mixture by 2.2×10 dpm per μc.

§ 20.6 *Interpretations.* Except as specifically authorized by the Commission in writing, no interpretation of the meaning of the regulations in this part by any officer or employee of the Commission other than a written interpretation by the General Counsel will be recognized to be binding upon the Commission.

§ 20.7 *Communications.* All communications and reports concerning the regulations in this part, and applications filed under them, should be addressed to the Atomic Energy Commission, 1901 Constitution Avenue NW., Washington 25, D. C., Attention: Division of Civilian Application.

PERMISSIBLE DOSES, LEVELS, AND CONCENTRATIONS

§ 20.101 *Exposure of individuals in restricted areas*—(a) *Exposure to radiation.* (1) Except as provided in subparagraph (2) of this paragraph, no licensee shall possess, use, or transfer licensed material in such a manner as to cause any individual in a restricted area to receive in any period of seven consecutive days from radioactive material and other sources of radiation in the licensee's possession a dose in excess of the limits specified in Appendix A of this part.

(2) A licensee may permit an individual in a restricted area to receive a dose in excess of the limits established in subparagraph (1) of this paragraph: *Provided,* (i) That the dose during any period of 7 consecutive days does not exceed three times the limits specified in Appendix A of this part, and (ii) that the dose during any period of 13 consecutive weeks does not exceed 10 times the limits specified in Appendix A of this part.

(b) No license shall possess, use or transfer licensed material in such a manner as to cause any individual in a restricted area to be exposed to airborne radioactive material possessed by the licensee in an average concentration in excess of the limits specified in Appendix B, Table I, of this part.

The limits given in Appendix B, Table I of this part, are based upon exposure to the concentrations specified for forty hours in any period of seven consecutive days. In any such period where the number of hours of exposure is less than forty, the limits specified in the table may be increased proportionately. In any such period, where the number of hours of exposure is greater than forty, the limits specified in the table shall be decreased proportionately.

(c) *Exposure of minors.* No licensee shall possess, use, or transfer licensed material in such a manner as to cause any individual under 18 years of age

within a restricted area to receive in any period of seven consecutive days from radioactive material and other sources of radiation in the licensee's possession a dose in excess of 10 percent of the limits specified in Appendix A of this part, or to be exposed to airborne radioactive material possessed by the licensee in a concentration in excess of the limits specified in Appendix B, Table II, of this part. For purposes of this paragraph, concentrations may be averaged over periods not greater than a week.

§ 20.102 *Permissible levels of radiation in unrestricted areas.* (a) There may be included in any application for a license or for amendment of a license proposed limits upon levels of radiation in unrestricted areas resulting from the applicant's possession or use of radioactive material and other sources of radiation. Such applications should include information as to anticipated average radiation levels and anticipated occupancy times for each unrestricted area involved. The Commission will approve the proposed limits if the applicant demonstrates that the proposed limits are not likely to cause any individual to receive a dose in any period of seven consecutive days in excess of 10 percent of the limits specified in Appendix A of this part.

(b) Except as authorized by the Commission pursuant to paragraph (a) of this section no licensee shall possess, use, or transfer licensed material in such a manner as to create in any unrestricted area from radioactive material and other sources of radiation in his possession:

(1) Radiation levels which, if an individual were continuously present in the area, could result in his receiving a dose in excess of two millirems in any one hour, or

(2) Radiation levels which, if an individual were continuously present in the area, could result in his receiving a dose in excess of 100 millirems in any seven consecutive days.

§ 20.103 *Concentrations in effluents to unrestricted areas.* (a) There may be included in any application for a license or for amendment of a license proposed limits upon concentrations of licensed and other radioactive material released into air or water in unrestricted areas as a result of the applicant's proposed activities. Such applications should include information as to anticipated average concentrations and anticipated occupancy times for each unrestricted area involved. The Commission will approve the proposed limits if the applicant demonstrates that it is not likely that any individual will be exposed to concentrations in excess of the limits specified in Appendix B, Table II, of this part. For purposes of this paragraph, concentrations may be averaged over periods not greater than one year.

(b) Except as authorized by the Commission purusant to § 20.302 or paragraph (a) of this section, no licensee shall possess, use, or transfer licensed material in such a manner as to release into air or water in any unrestricted area any concentration of radioactive material in excess of the limits specified in Appendix B, Table II of this part. For purposes of this paragraph, concentrations may be averaged over periods not greater than one year.

(c) For purposes of this section, determinations as to the concentration of radioactive material shall be made with respect to the point where such material leaves the restricted area. Where the radioactive material leaves the restricted area in a stack, tube, pipe, or similar conduit, the determination may be made with respect to the point where the material leaves such conduit.

(d) The provisions of this section do not apply to disposal of radioactive material into sanitary sewerage systems (see § 20.303).

§ 20.104 *Medical diagnosis, therapy, and research.* Nothing in the regulations in this part shall be interpreted as limiting the intentional exposure of patients to radiation for the purpose of medical diagnosis or medical therapy.

§ 20.105 *Measures to be taken after excessive exposures.* In the event that any individual in a restricted area receives a dose or is exposed to concentrations of radioactive material in excess of the permissible limits established in § 20.101, the licensee shall limit the weekly dose or exposure of the individual to 10 percent of such permissible limit until such time as the average weekly dose or exposure to the individual for the period beginning with the week in which the excessive dose or exposure occurred is less than the permissible limit established in § 20.101.

PRECAUTIONARY PROCEDURES

§ 20.201 *Surveys.* (a) As used in the regulations in this part, "survey" means an evaluation of the radiation hazards incident to the production, use, release, disposal, or presence of radioactive materials or other sources of radia-

tion under a specific set of conditions. When appropriate, such evaluation includes a physical survey of the location of materials and equipment, and measurements of levels of radiation or concentrations of radioactive material present.

(b) Each licensee shall make or cause to be made such surveys as may be necessary for him to comply with the regulations in this part.

§ 20.202 *Personnel monitoring.* (a) Each licensee shall supply appropriate personnel monitoring equipment to, and shall require the use of such equipment by:

(1) Each individual who enters a restricted area under such circumstances that he receives, or is likely to receive, a dose in excess of 25 percent of the limits specified in Appendix A of this part;

(2) Each individual who enters a high radiation area.

(b) As used in this part,

(1) "Personnel monitoring equipment" means devices designed to be worn or carried by an individual for the purpose of measuring the dose received (e. g., film badges, pocket chambers, pocket dosimeters, film rings, etc.);

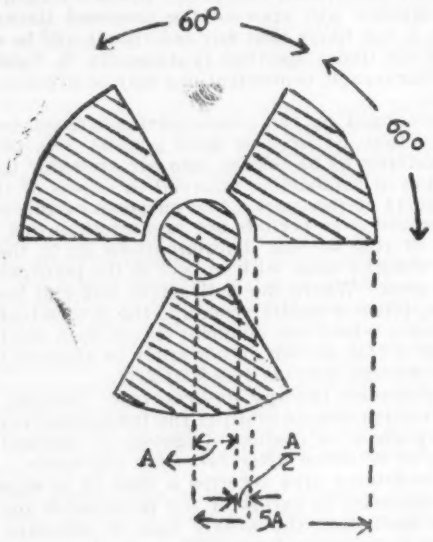
(2) "Radiation area" means any area, accessible to personnel, in which there exists radiation, originating in whole or in part within licensed material, at such levels that a major portion of the body could receive in any one hour a dose in excess of 5 millirem, or in any 5 consecutive days a dose in excess of 150 millirem;

(3) "High radiation area" means any area, accessible to personnel, in which there exists radiation originating in whole or in part within licensed material at such levels that a major portion of the body could receive in any one hour a dose in excess of 100 millirem.

§ 20.203 *Caution signs, labels, and signals.* (a) (1) Except as otherwise authorized by the Commission, symbols prescribed by this section shall use the conventional radiation caution colors (magenta or purple on yellow background). The symbol prescribed by this section is the conventional three-bladed design:

RADIATION SYMBOL

1. Cross-hatched area is to be magenta or purple.
2. Background is to be yellow.



(2) In addition to the contents of signs and labels prescribed in this section, licensees may provide on or near such signs and labels any additional information which may be appropriate in aiding individuals to minimize exposure to radiation or to radioactive material.

(b) *Radiation areas.* Each radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION [1]

RADIATION AREA

(c) *High radiation areas.* (1) Each high radiation area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION [1]

HIGH RADIATION AREA

(2) Each high radiation area shall be equipped with a control device which shall either cause the level of radiation to be reduced below that at which an individual might receive a dose of 100 millirem in one hour upon entry into the area or shall energize a conspicuous visible or audible alarm signal in such a manner that the individual entering and the licensee or a supervisor of the activity are made aware of the entry. In the case of a high radiation area established for a period of 30 days or less, such control device is not required.

(d) *Airborne radioactivity areas.* (1) As used in the regulations in this part, "airborne radioactivity area" means (i) any room, enclosure, or operating area in which airborne radioactive materials, composed wholly or partly of licensed material, exist in concentrations in excess of the amounts specified in Appendix B, Table I, Column 1 of this part; or (ii) any room, enclosure, or operating area in which airborne radioactive material composed wholly or partly of licensed material exists in concentrations which, averaged over the number of hours in any week during which individuals are in the area, exceed 25 percent of the amounts specified in Appendix B, Table I, Column 1 of this part.

(2) Each airborne radioactivity area shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION [1]

AIRBORNE RADIOACTIVITY AREA

(e) *Additional requirements.* (1) Each area or room in which licensed material is used or stored and which contains any radioactive material (other than natural uranium or thorium) in an amount exceeding 10 times the quantity of such material specified in Appendix C of this part shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION [1]

RADIOACTIVE MATERIAL(S)

(2) Each area or room in which natural uranium or thorium is used or stored in an amount exceeding one hundred times the quantity specified in Appendix C of this part shall be conspicuously posted with a sign or signs bearing the radiation caution symbol and the words:

CAUTION [1]

RADIOACTIVE MATERIAL(S)

(f) *Containers.* (1) Each container in which is transported, stored, or used a quantity of any licensed material (other than natural uranium or thorium) greater than the quantity of such material specified in Appendix C of this part shall bear a durable, clearly visible label bearing the radiation caution symbol and the words:

CAUTION [1]

RADIOACTIVE MATERIAL

(2) Each container in which natural uranium or thorium is transported, stored, or used in a quantity greater than ten times the quantity specified in Appendix C of this part shall bear a durable, clearly visible label bearing the radiation caution symbol and the words:

CAUTION [1]

RADIOACTIVE MATERIAL

(3) Notwithstanding the provisions of subparagraphs (1) and (2) a label shall not be required:

(i) If the concentration of the material in the container does not exceed that specified in Appendix B, Table I, Column 2 of this part, or

[1] Or "Danger".

(ii) For laboratory containers, such as beakers, flasks, and test tubes, used transiently in laboratory procedures, when the user is present.

(4) Where containers are used for storage, the labels required in this paragraph shall state also the quantities and kinds of radioactive materials in the containers and the date of measurement of the quantities.

visions of § 20.203.

§ 20.204 *Exceptions from posting requirements.* Notwithstanding the pro-

(a) A room or area is not required to be posted with a caution sign because of the presence of a sealed source provided the radiation level twelve inches from the surface of the source container or housing does not exceed five millirem per hour.

(b) Rooms or other areas in hospitals are not required to be posted with caution signs because of the presence of patients containing byproduct material provided that there are personnel in attendance who shall take the precautions necessary to prevent the exposure of any individual to radiation or radioactive material in excess of the limits established in the regulations in this part.

(c) Caution signs are not required to be posted at areas or rooms containing radioactive materials for periods of less than eight hours provided that (1) the materials are constantly attended during such periods by an individual who shall take the precautions necessary to prevent the exposure of any individual to radiation or radioactive materials in excess of the limits established in the regulations in this part and, (2) such area or room is subject to the licensee's control.

§ 20.205 *Exemptions for radioactive materials packaged for shipment.* Radioactive materials packaged and labeled in accordance with regulations of the Interstate Commerce Commission shall be exempt from the labeling and posting requirements of § 20.203 during shipment, provided that the inside containers are labeled in accordance with the provisions of § 20.203 (f).

§ 20.206 *Instruction of personnel.* All individuals working in or frequenting any portion of a restricted area shall be informed of the occurrence of radioactive materials or of radiation in such portion, and shall be instructed in the hazards of excessive exposure to such materials or radiation and in precautions or procedures to minimize exposure.

§ 20.207 *Storage of licensed material.* Licensed materials stored in an unrestricted area shall be secured against unauthorized removal from the place of storage.

WASTE DISPOSAL

§ 20.301 *General requirement.* No licensee shall dispose of licensed material except:

(1) By transfer to an authorized recipient as provided in the regulations in Part 30, 40, or 70 of this chapter, whichever may be applicable; or

(2) As authorized pursuant to § 20.302; or

(3) As provided in § 20.303 or § 20.304, applicable respectively to the disposal of licensed material by release into sanitary sewerage systems or burial in soil, or in § 20.103 (Concentrations in Effluents to Unrestricted Areas).

§ 20.302 *Method for obtaining approval of proposed disposal procedures.* Any licensee or applicant for a license may apply to the Commission for approval of proposed procedures to dispose of licensed material in a manner not otherwise authorized in the regulations in this chapter. Each application should include a description of the licensed material and any other radioactive material involved, including the quantities and kinds of such material and the levels of radioactivity involved, and the proposed manner and conditions of disposal. The application should also include an analysis and evaluation of pertinent information as to the nature of the environment, including topographical, geological, meteorological, and hydrological characteristics; usage of ground and surface waters in the general area; the nature and location of other potentially affected facilities; and procedures to be observed to minimize the risk of unexpected or hazardous exposures.

§ 20.303 *Disposal by release into sanitary sewerage systems.* No licensee shall discharge licensed material into a sanitary sewerage system unless:

(a) It is readily soluble or dispersible in water; and

(b) The quantity of any licensed or other radioactive material released into the system by the licensee in any one day does not exceed the larger of subparagraphs (1) or (2) of this paragraph:

(1) The quantity which, if diluted by the average daily quantity of sewage released into the sewer by the licensee, will result in an average concentration equal to the limits specified in Appendix B, Table I, Column 2 of this part; or

(2) Ten times the quantity of such material specified in Appendix C of this part; and

(c) The quantity of any licensed or other radioactive material released in any one month, if diluted by the average monthly quantity of water released by the licensee, will not result in an average concentration exceeding the limits specified in Appendix B, Table I, Column 2 of this part; and

(d) The gross quantity of licensed and other radioactive material released into the sewerage system by the licensee does not exceed one curie per year.

Excreta from individuals undergoing medical diagnosis or therapy with radioactive material shall be exempt from any limitation contained in this section.

§ 20.304 *Disposal by burial in soil.* No licensee shall dispose of licensed material by burial in soil unless:

(a) The total quantity of licensed and other radioactice materials buried at any one location and time does not exceed, at the time of burial, 1,000 times the amount specified in Appendix C of this part; and

(b) Burial is at a minimum depth of four feet; and

(c) Successive burials are separate by distances of at least six feet and not more than 12 burials are made in any year.

RECORDS, REPORT, AND NOTIFICATION

§ 20.401 *Records of surveys, radiation monitoring, and disposal.* (a) Each licensee shall maintain records showing the radiation exposures of all individuals subject to personnel monitoring control under § 20.202 of the regulations in this part.

(b) Each licensee shall maintain records showing the name of each individual exposed to radiation pursuant to § 20.101 (a) (2) and the weekly dose of such individual for the 13 consecutive weeks of highest cumulative weekly dose.

(c) Each licensee shall maintain records in the same units used in the appendices to this part, showing the results of surveys required by § 20.210 (b), and disposals made under §§ 20.302, 20.303, and 20.304.

§ 20.402 *Reports of theft or loss of licensed material.* Each licensee shall report promptly to the Commission, after its occurrence becomes known to the licensee, any loss or theft of licensed material in such quantities and under such circumstances that it appears to the licensee that a substantial hazard may result to persons in unrestricted areas.

EXCEPTIONS AND ADDITIONAL REQUIREMENTS

§ 20.501 *Applications for exemptions.* The Commission may, upon application by any licensee or upon its own initiative grant such exemptions from the requirements of the regulations in this part as it determines are authorized by law and will not result in undue hazard to life or property.

§ 20.502 *Additional requirements.* The Commission may, by rule, regulation, or order, impose upon any licensee such requirements, in addition to those established in the regulations in this part, as it deems appropriate or necessary to protect health or to minimize danger to life or property.

ENFORCEMENT

§ 20.601 *Violations.* An injunction or other court order may be obtained prohibiting any violation of any provision of the act or any regulation or order issued thereunder. Any person who willfully violates any provision of the act or any regulation or order issued thereunder may be guilty of a crime and, upon conviction, may be punished by fine or imprisonment or both, as provided by law.

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APPENDIX A

Permissible weekly dose

Conditions of exposure		Dose in critical organs (mrem)			
Parts of body	Radiation	Skin, at basal layer of epidermis	Blood-forming organs	Gonads	Lens of eye
Whole body	Any radiation with half-value-layer greater than 1 mm of soft tissue.	[1] 600	[1] 300	[1] 300	[1] 300
Whole body	Any radiation with half-value-layer less than 1 mm of soft tissue.	1, 500	300	300	300
Hands and forearms or feet and ankles or head and neck.	Any radiation	[2] 1, 500			

[1] For exposures of the whole body to X or gamma rays up to 3 mev, this condition may be assumed to be met if the "air dose" does not exceed 300 mr, provided the dose to the gonads does not exceed 300 mrem. "Air dose" means that the dose is measured by an appropriate instrument in air in the region of highest dosage rate to be occupied by an individual, without the presence of the human body or other absorbing and scattering material.

[2] Exposure of these limited portions of the body under these conditions does not alter the total weekly dose of 300 mrem permitted to the bloodforming organs in the main portion of the body, to the gonads, or to the lens of the eye.

APPENDIX B

Permissible concentrations in air and water above natural background

Material	Table I		Table II	
	Column 1 [1] Air (2)	Column 2 [2] Water (3)	Column 1 [1] Air (2)	Column 2 [2] Water (3)
A^{41}	1.6×10^{-6}	1.4×10^{-3}	5×10^{-6}	5×10^{-5}
Ag^{105}	3.6×10^{-6}	5	1.2×10^{-6}	1.6×10^{-1}
Ag^{111}	1×10^{-4}	13	3×10^{-6}	4×10^{-1}
Am^{241}	8×10^{-11}	4×10^{-4}	3×10^{-12}	1.3×10^{-6}
As^{76}	7×10^{-6}	6×10^{-1}	2×10^{-7}	2×10^{-3}
At^{211}	9×10^{-10}	6×10^{-6}	3×10^{-11}	2×10^{-7}
Au^{196}	3.4×10^{-7}	9×10^{-3}	1.1×18^{-6}	3×10^{-4}
Au^{199}	8×10^{-7}	2×10^{-2}	2.5×10^{-6}	7×10^{-4}
$Ba^{140}+La^{140}$	2×10^{-7}	6×10^{-3}	6×10^{-9}	2×10^{-4}
Be^{7}	1.3×10^{-5}	3	4×10^{-7}	1×10^{-1}
C^{14}	1.4×10^{-6}	1×10^{-2}	5×10^{-8}	3.6×10^{-4}
Ca^{45}	9×10^{-6}	1.5×10^{-3}	3×10^{-9}	5×10^{-5}
$Cd^{109}+Ag^{109}$	2×10^{-7}	2×10^{-1}	7×10^{-9}	7×10^{-3}
$Ce^{144}+Pr^{144}$	2×10^{-6}	1×10^{-1}	7×10^{-10}	3.6×10^{-3}
Cl^{36}	1×10^{-6}	7×10^{-3}	4×10^{-8}	2.4×10^{-4}
Cm^{242}	5×10^{-10}	2.7×10^{-3}	1.8×10^{-11}	1×10^{-4}
Co^{60}	3.4×10^{-6}	5×10^{-2}	1.2×10^{-7}	1.8×10^{-3}
Cr^{51}	2.4×10^{-5}	1.4	8×10^{-7}	5×10^{-2}
$Cs^{137}+Ba^{137}$	6×10^{-7}	4.5×10^{-3}	2×10^{-8}	1.5×10^{-4}
Cu^{64}	2×10^{-5}	2.5×10^{-1}	6×10^{-7}	8×10^{-3}
Eu^{154}	2×10^{-8}	1×10^{-1}	6×10^{-10}	3×10^{-3}
F^{18}	3.5×10^{-4}	2.6	1.2×10^{-5}	9×10^{-2}
Fe^{55}	1.8×10^{-6}	1.3×10^{-2}	6×10^{-8}	4×10^{-4}
Fe^{59}	5×10^{-6}	3.3×10^{-4}	1.5×10^{-8}	1.1×10^{-3}
Ga^{72}	1×10^{-5}	26	3.4×10^{-7}	9×10^{-1}
Ge^{71}	1×10^{-4}	27	3.6×10^{-6}	9×10^{-1}
H^{3} (HTO or T_2O)	7×10^{-5}	5×10^{-1}	2.5×10^{-6}	1.6×10^{-2}
Ho^{166}	1×10^{-5}	70	3×10^{-7}	2.3
I^{131}	9×10^{-9}	9×10^{-5}	3×10^{-10}	3×10^{-6}
Ir^{190}	2.2×10^{-6}	4×10^{-2}	7×10^{-8}	1.3×10^{-3}
Ir^{192}	1.5×10^{-7}	2.7×10^{-3}	5×10^{-9}	9×10^{-5}
K^{42}	6×10^{-6}	4×10^{-2}	2×10^{-7}	1.4×10^{-3}
La^{140}	4×10^{-6}	3.4	1.4×10^{-7}	1.1×10^{-1}
Lu^{177}	1.5×10^{-5}	70	5×10^{-7}	2.4
Mn^{56}	8×10^{-6}	5×10^{-1}	3×10^{-7}	1.5×10^{-2}
Mo^{99}	5×10^{-5}	40	1.8×10^{-6}	1.4
Na^{24}	5×10^{-6}	2.4×10^{-2}	1.6×10^{-7}	8×10^{-4}

See footnotes at end of table.

APPENDIX B—Continued

Permissible concentrations in air and water above natural background—Con.

Material	Table I		Table II	
	Column 1 [1] Air (2)	Column 2 [2] Water (3)	Column 1 [1] Air (2)	Column 2 [2] Water (3)
Nb^{95}	1.3×10^{-6}	1.2×10^{-2}	4×10^{-8}	4×10^{-4}
Ni^{59}	5×10^{-5}	7×10^{-1}	1.6×10^{-6}	2.5×10^{-2}
P^{32}	4×10^{-7}	6×10^{-4}	1.4×10^{-8}	2×10^{-5}
Pb^{203}	2×10^{-6}	4×10^{-1}	6×10^{-7}	1.4×10^{-2}
$Pb^{103}+Rh^{103}$	2×10^{-6}	3×10^{-2}	7×10^{-8}	1×10^{-3}
Pm^{147}	6×10^{-7}	3	2×10^{-8}	1×10^{-1}
Po^{210} (soluble)	6×10^{-10}	9×10^{-3}	2×10^{-11}	3×10^{-4}
Po^{210} (insoluble)	2×10^{-10}		7×10^{-13}	
Pr^{143}	2.3×10^{-6}	1	7×10^{-8}	3.6×10^{-2}
Pu^{239} (soluble)	6×10^{-12}	4.5×10^{-4}	2×10^{-13}	1.5×10^{-7}
Pu^{239} (insoluble)	6×10^{-12}		2×10^{-13}	
$Ra^{226}+1/2$ dr	2.4×10^{-11}	1.2×10^{-7}	8×10^{-13}	4×10^{-9}
Rb^{86}	1.1×10^{-6}	9×10^{-3}	4×10^{-8}	3×10^{-4}
Re^{186}	2.4×10^{-6}	2.4×10^{-1}	8×10^{-7}	8×10^{-3}
Rh^{105}	3×10^{-6}	5×10^{-2}	1×10^{-7}	1.6×10^{-3}
$Rh^{222}+dr$	1×10^{-7}	6×10^{-6}	3.3×10^{-9}	2×10^{-7}
$Ru^{106}+Rh^{106}$	8×10^{-8}	4×10^{-1}	2.6×10^{-9}	1.3×10^{-2}
S^{35}	3×10^{-6}	1.5×10^{-2}	1×10^{-7}	5×10^{-4}
Sc^{46}	2×10^{-7}	1	7×10^{-9}	3.6×10^{-2}
Sm^{151}	4×10^{-5}	6×14^{-1}	1.3×10^{-9}	2×10^{-2}
Sn^{113}	1.7×10^{-6}	5×10^{-1}	6×10^{-8}	1.6×10^{-2}
Sr^{89}	6×10^{-8}	2×10^{-4}	2×10^{-9}	7×10^{-6}
$Sr^{90}+Y^{90}$	6×10^{-10}	2.4×10^{-6}	2×10^{-11}	8×10^{-8}
Te^{96}	8×10^{-6}	8×10^{-2}	3×10^{-7}	3×10^{-3}
Te^{127}	3×10^{-7}	8×10^{-2}	1×10^{-8}	3×10^{-3}
Te^{129}	1.2×10^{-7}	3.3×10^{-2}	4×10^{-9}	1.1×10^{-3}
Th^{234}	2×10^{-6}	10	6×10^{-8}	3×10^{-1}
Th-natural (soluble)	5×10^{-11}	1.5×10^{-6}	1.7×10^{-12}	5×10^{-8}
Th-natural (insoluble)	5×10^{-11}		1.7×10^{-12}	
Tm^{170}	1.5×10^{-7}	8×10^{-1}	5×10^{-9}	2.5×10^{-2}
U-natural (soluble) [3]	5×10^{-11}	2×10^{-4}	1.7×10^{-12}	7×10^{-6}
U-natural (insoluble) [3]	5×10^{-11}		1.7×10^{-12}	
U^{233} (soluble)	4×10^{-10}	4.5×10^{-4}	1×10^{-11}	1.5×10^{-5}
U^{233} (insoluble)	5×10^{-11}		1.6×10^{-12}	
V^{49}	3×10^{-6}	1.5	1×10^{-7}	5×10^{-2}
Xe^{133}	1.3×10^{-5}	1.3×10^{-2}	4×10^{-7}	4×10^{-4}
Xe^{135}	5×10^{-6}	4×10^{-3}	1.7×10^{-7}	1.4×10^{-4}
Y^{91}	1.2×10^{-7}	6×10^{-1}	4×10^{-9}	2×10^{-2}
Zn^{65}	6×10^{-6}	2×10^{-1}	2×10^{-7}	6×10^{-3}
Unidentified beta or gamma emitters or any undetermined mixtures of betta or gamma emitters			1×10^{-9}	1×10^{-7}
Unidentified alpha emitters or any undetermined mixtures of alpha emitters			5×10^{-13}	1×10^{-7}

[1] Air concentrations are given in microcuries per milliliter of air.

[2] Water concentrations are given in microcuries per milliliter of water. These figures also apply to food stuffs in microcuries per gram (wet-weight).

[3] For enriched uranium the same radioactivities per unit volume as those for natural uranium are applicable. It should be noted that the contribution of U–234 to the gross activity of enriched uranium is 20–40 times that of the U–235.

APPENDIX C

Material	Microcuries	Material	Microcuries
Ag^{105}	1	$Pd^{103}+Rh^{103}$	50
Ag^{111}	10	Pd^{109}	10
As^{76}, As^{77}	10	Pm^{147}	10
Au^{196}	10	Po^{210}	0.1
Au^{198}	10	Pr^{143}	10
$Ba^{140}+La^{140}$	1	Pu^{239}	1
Be^{7}	50	Ra^{226}	0.1
C^{14}	50	Rb^{86}	10
Ca^{45}	10	Re^{186}	10
$Cd^{109}+Ag^{109}$	10	Rh^{105}	10
$Ce^{144}+Pr^{144}$	1	$Ru^{106}+Rh^{106}$	1
Cl^{36}	1	S^{35}	50
Co^{60}	1	Sb^{124}	1
Cr^{51}	50	Sc^{46}	1
$Cs^{137}+Ba^{137}$	1	Sm^{153}	10
Cu^{64}	50	Sn^{113}	10
Eu^{154}	1	Sr^{89}	1
F^{18}	50	$Sr^{90}+Y^{90}$	0.1
Fe^{55}	50	Ta^{182}	10
Fe^{59}	1	Tc^{96}	1
Ga^{72}	10	Tc^{99}	1
Ge^{71}	50	Te^{127}	10
H^{3}(HTO or $H^{3}_{2}O$)	250	Te^{129}	1
I^{131}	10	Th (natural)	50
In^{114}	1	Tl^{204}	50
Ir^{192}	10	Tritium. See H^{3}	250
K^{42}	10	U (natural)	50
La^{140}	10	U^{233}	1
Mn^{52}	1	U^{234}-U^{235}	50
Mn^{56}	50	V^{48}	1
Mo^{99}	10	W^{185}	10
Na^{22}	10	Y^{90}	1
Na^{24}	10	Y^{91}	1
Nb^{95}	10	Zn^{65}	10
Ni^{59}	1	Unidentified radioactive materials or any of the above in unknown mixtures	0.1
Ni^{63}	1		
P^{32}	10		

NOTE: The record keeping and reporting requirements contained herein have been approved by the Bureau of the Budget in accordance with the Federal Reports Act of 1942.

Dated at Washington, D. C., this 16th day of January 1957.
For the Atomic Energy Commission.

K. E. FIELDS,
General Manager.

NOTE: For purposes of §§ 20.203 and 20.304, where there is involved a combination of isotopes in known amounts the limit for the combination should be derived as follows: Determine, for each isotope in the combination, the ratio between the quantity present in the combination and the limit otherwise established for the specific isotope when not in combination. The sum of such ratios for all the isotopes in the combination may not exceed "1" (i. e., "unity").

EXAMPLE: For purposes of § 20.304, if a particular batch contains 2,000 μc of Au^{198} and 25,000 μc of C^{14}, it may also include not more than 3,000 μc of I^{131}. This limit was determined as follows:

$$\frac{2{,}000\ \mu c\ Au^{198}}{10{,}000\ \mu c}+\frac{25{,}000\ \mu c\ C^{14}}{50{,}000\ \mu c}+\frac{3{,}000\ \mu c\ I^{131}}{10{,}000\ \mu c}=1$$

The denominator in each of the above ratios was obtained by multiplying the figure in the table by 1000 as provided in § 20.304.

[F. R. Doc. 57-511; Filed, Jan. 25, 1957; 12:30 p. m.]

The CHAIRMAN. Without objection, the committee will adjourn until tomorrow morning at 10 o'clock.

(A later letter referred to on p. 20, regarding proposed amendments to section 170b and 170c follows:)

UNITED STATES ATOMIC ENERGY COMMISSION,
Washington 25, D. C., April 10, 1957.

Hon. CARL T. DURHAM,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States.

DEAR MR. DURHAM: We have given further consideration to our recommendations for amendments to S. 715 and H. R. 1981, which were presented to the

Joint Committee on Atomic Energy in our testimony at the hearings on these bills on March 25, and we wish to modify those recommendations in two respects.

First, our recommendation for amendment of section 170 (c) to provide that persons who might be liable for a nuclear incident, other than licensees and their suppliers, be indemnified in full was made to provide assurance that there would be no gap in the protection afforded to the public. Since the insurance syndicates had not proposed to provide coverage for these persons, we concluded that our recommendation was appropriate. However, if the insurance industry will afford this coverage for all such persons, this recommended revision would not be necessary. We would prefer that this coverage be provided by private insurance if the insurance industry can do so.

The other recommendation which we wish to modify is our suggested deletion in section 170 (b) of cost and terms of private insurance from the criteria for determining the amount of financial protection to be required of licensees. We assume it is not intended that the criterion of costs would require a determination to be based on the ability of licensees to pay such costs. We believe we would have great difficulty in applying a criterion of ability to pay. Presumably we would have to look at insurance costs in relation to capital and other operating costs and in relation to costs of liability insurance generally. On this basis, we believe it would be possible to develop a satisfactory method of applyig the cost criterion.

Sincerely yours,

LEWIS L. STRAUSS, *Chairman.*

(Thereupon at 11:55 a. m., Monday, March 25, 1957, a recess was taken until Tuesday, March 26, 1957, at 10 a. m.)

GOVERNMENTAL INDEMNITY AND REACTOR SAFETY

TUESDAY, MARCH 26, 1957

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
Washington, D. C.

The committee met, pursuant to recess, at 10 a. m., in room 219, Old House Office Building, Representative Carl T. Durham, of North Carolina (chairman of the committee) presiding.

Present: Representatives Durham, Price, Cole, Van Zandt and Jenkins; Senator Anderson.

Also present: James T. Ramey, Executive Director, George Norris, Jr., committee counsel, and George Brown, Jr., David R. Toll, Hal Hollister, professional members of the staff.

The CHAIRMAN. The committee will come to order.

This is a continuation of the hearing on H. R. 1981 and S. 715. This morning I believe we have Mr. Charles J. Haugh as the first witness.

STATEMENT OF CHARLES J. HAUGH, NUCLEAR ENERGY LIABILITY INSURANCE ASSOCIATION

Mr. HAUGH. Thank you, Mr. Chairman. If I may, I would like to first read this statement. It is not too long.

The CHAIRMAN. You may proceed.

Mr. HAUGH. My name is Charles J. Haugh. I am vice president of the Travelers Indemnity Co. and the Travelers Insurance Co., and am here representing the Nuclear Energy Liability Insurance Association, which is an organization of some 135 capital-stock insurance companies established for the purpose of affording liability insurance for nuclear reactors and related operations.

Unless you gentlemen desire me to do so, I shall not take the time of this committee to explain the organization and establishment of the Nuclear Energy Liability Insurance Association as that has been covered in testimony as previous hearings held by your committee. Since those hearings were held, a great deal of progress has been made. I am glad to be able to report that a policy for affording liability insurance of reactors has been promulgated, a procedure for the determination of premiums for such risks has been established, and these have been filed with the supervising officials of the several States and are available for use both by the Nuclear Energy Liability Insurance Association and by the Mutual Atomic Energy Insurance Pool.

Representative COLE. May I suggest at this point that you indicate in the record what the Mutual Atomic Energy Insurance Pool is?

Mr. HAUGH. Thank you, Mr. Cole. The Mutual Atomic Energy Insurance Pool is an organization of mutual insurance companies, established to afford liability insurance for nuclear energy risks just as the stock company association to which I referred was established to afford such insurance by those companies. The two organizations are cooperating in the rating and writing of such business.

The CHAIRMAN. This was formed under what State law, Mr. Haugh?

Mr. HAUGH. These are formed, sir, under the laws of Several States which provide for joint underwriting syndicates to provide a market and facilities for the writing of risks presenting abnormal hazards or requiring abnormally large amounts of insurance. The several State rating laws provide for joint underwriting organizations in such instances.

The CHAIRMAN. Do they deal with any other insurance excepting nuclear energy liability?

Mr. HAUGH. The Nuclear Energy Liability Insurance Association deals with the writing of liability insurance for nuclear energy risks which will be primarily reactors, but also related risks such as fuel reprocessing establishments and similar risks which have a nuclear energy hazard. I think that is also true with respect to the Mutual Atomic Energy Insurance Pool, but I would rather, if you don't mind, sir, have Mr. Yount, who is I understand going to testify this morning, explain in detail with respect to that organization since he is more thoroughly familiar with it than I.

The CHAIRMAN. You may proceed.

Mr. HAUGH. Premium charges. In general, the liability hazard among reactors may vary markedly one from another depending upon five major criteria, namely, the type of reactor, use of the reactor, reactor size in terms of megawatts of heat, location of the reactor, and the degree of containment. The liability insurance premium for the individual reactor can be determined only after a consideration of all of these factors as they relate to the individual reactor.

The rating procedure contemplates that after determination of the annual premium charge for the first million dollars of insurance in the light of the several elements affecting the hazard of the individual reactor, the charges for additional millions shall be arrived at as percentages of this base premium as follows:

For the first million dollars of insurance, base premium charge.

For each of the next $4 million of insurance, 50 percent of base.

For each of the next $5 million of insurance, 20 percent of base.

For each of the next $10 million of insurance, 10 percent of base.

For each of the next $20 million of insurance, 5 percent of base.

For each million dollars of insurance in excess of $40 million of insurance, 2½ percent of base.

All these charges are subject to a minimum charge of $1,000 per million dollars of insurance for power reactors, and of $500 per million dollars of insurance for test and research reactors.

Because test and research type reactors involve more direct exposure to members of the public, such as students, scientists, and employees of outside concerns; provision is made for a supplemental charge in the base premium for the first million dollars of insurance for such reactors. However, the supplemental charge is not ap-

plicable to the determination of charges for additional millions of insurance.

Of necessity, the rating of liability insurance for nuclear reactors is based, to a substantial extent, upon underwriting judgment supported by the best information currently available. The potential hazards are extremely great and the limits of insurance which are being sought are much greater than anything heretofore purchased. There is incorporated into the rating procedure a long term industry-wide rating plan whereby the premiums will be reviewed in the light of subsequent experience, and in the event substantial losses do not emerge over a period of time, a retroactive reduction of premium charges will be made. This procedure contemplates that at the expiration of a 10-year period, a comparison will be made between the aggregate amount available for losses (including loss adjustment expense) in the premiums earned during the first 10 years and the actual losses (including loss adjustment expense) incurred. If the provision for losses exceeds the actual losses incurred for the period, an appropriate retroactive reduction will be made in the premiums charged every risk during the first year of operation. Annually thereafter, similar reviews will be made based upon the experience of the most recent 10-year period.

Ultimately, when reactors have come into general use and insured experience is available for ratemaking, this retroactive review may very well become outmoded. For the present, however, and probably for some time to come, it does afford a very useful and reasonable procedure for ultimate modification of premium charges in the event the hazard should be found to have been less than contemplated.

Tentative annual provisional premiums for liability insurance have been calculated for several types of reactors and are cited here for the purpose of illustrating the premium charges indicated for these several types.

1. Power reactor of boiling-water type, 600 plus megawatts of heat, fully contained, located in a high value agricultural area.

Representative COLE. Mr. Chairman, in order to understand Mr. Haugh's statement, I wish you would tell me what you have in mind when you say fully contained.

Mr. HAUGH. I appreciate your query, Mr. Cole. We hope it is fully contained. Let me say that the containment contemplated in the construction of the reactor is such that it may be anticipated any excursion which might be expected as a result of a chemical reaction, an explosion in the reactor resulting in a release of fission products would be contained within the reactor or its housing, and only under most abnormal conditions will it be possible for the housing to be ruptured so that the fission products would be dispersed outside of the reactor site.

Representative COLE. With respect to the reactors themselves, is it contemplated that any type would be less than fully contained?

Mr. HAUGH. It could be. You may say I am taking a very simple illustration, but it does illustrate it best—a swimming pool reactor, for instance. I myself have visited just one swimming pool reactor that was not fully contained. As a matter of fact, it was in a building in which you just open the door and walk in, and the reactor

was within the open pool. I was not unduly perturbed by it. I grant you it was a very small capacity reactor. But that one in itself was not fully contained. That I appreciate was not a power reactor, of course.

Representative COLE. Generally I know what you have in mind.

Mr. HAUGH. In our rating of a large power reactor which is over 600 megawatts of heat, fully contained, and located in a high value agricultural area, the following table indicates the charges.

Amount of insurance	Annual premium per million of insurance	Total annual premium
First $1,000,000	$40,000	$40,000
Next $4,000,000	20,000	80,000
Next $5,000,000	8,000	40,000
Next $10,000,000	4,000	40,000
Next $20,000,000	2,000	40,000
Over $40,000,000	1,000	

The annual provisional premium for $50 million of insurance would be $250,000.

Representative COLE. Mr. Chairman, there are not very many members of the committee to do the interrupting. I wonder if you would permit interruptions.

I am curious to know what was the procedure by which a base figure of $40,000 was determined for $1 million.

Mr. HAUGH. I want to stress at the outset, admittedly to a substantial extent it is judgment. What we have actually done was to have a discussion with a number of technical people and undertook to determine with a hypothetical reactor as a base, what would a reasonable premium be for a large power reactor under a given set of provisions. We sought to establish a premium which offers reasonable prospects of measuring the hazard as we understand it to exist today, but recognizing as we do that we can't be certain we have superimposed the retroactive adjustment. We hope we are not wrong to the extent that the rates are not adequate because if that is so, we do lose. It is strictly on judgment, sir, discussing with technicians the potential loss and determining if there were substantial numbers of reactors, to what extent would you require premiums which would permit of the payment of what I will call normal losses—not catastrophe, but individual instances of claimants, of which there will be some—and in addition the amount of contribution toward an overall fund which may accumulate over the years to take care of what we hope will be the very rare instance of a catastrophic loss.

Having established a premium for a basic reactor we then related all others to it. We undertook to establish a basic premium for a high-power reactor located in a populated area. I say in. Let me say adjacent to a populated area. The reactor was fully contained. We undertook to determine what a reasonable charge would be for that for the first million dollars of coverage, and then related our percentage charges that I recited earlier.

For other reactors we undertook to then say, in relation to this base, is this better or worse than that base. Is it of less power? Is it in a rural area? Is it in a sparsely settled area? In the case I

just cited as an illustration, it is in a high value agricultural area. It must be recognized that the area in which the reactor is located or to which it is adjacent is going to affect to a substantial extent the possible property loss in the event of an excursion. We recognize that and undertake to determine that in a highly populated area, other things being equal, we would need a much greater charge both for property damage and damage to persons than we would, let me say, in an agricultural area.

That in turn would be greater than we would need if the risk were located in a sparsely settled area where land values were relatively low. All this is judgment, admittedly. We have endeavored in each individual case considered, with the aid and advice of technicians, to establish charges that seem reasonable to measure differences in potential losses in the remote event that there was an excursion or a serious incident from the reactor.

In addition, of course, we have to consider the possibility of not just an excursion, but of individual claims in the event of some relatively minor puff of radioactive material that in itself might not do extensive damage, but might result in individual public claims. The more densely populated the surrounding area, the greater the likelihood that such claims may arise.

The CHAIRMAN. Did you have anything that you can make a comparison with as to the cost? For instance, on a conventional type power-producing plant, would that give you any information, or did you try to compare it with any other line of insurance on a disaster basis?

Mr. HAUGH. We really don't have a great deal to compare it with directly. As far as the catastrophe hazard of reactors is concerned, frankly it is not comparable with anything with which we normally deal in liability. Today, in buying liability insurance, an electric utility may purchase only excess insurance. I cannot think of something comparable in terms of catastrophe. They may want to purchase insurance in the amount of up to $5 million. If you are talking about the layer of primary insurance, that is a different type of hazard. That covers their liability for injury or damage done by their linemen, injury to members of the public on their premises, and so on.

Thinking in terms of catastrophe for a utility normally is quite a different thing than this could be. It could happen, of course, that as a result of alleged negligence on the part of a utility with some high-tension lines, fires might be started and cause serious damage to the public. But it is not in the nature of this sort of thing.

I will say this, sir; it has some bearing on the charges for these additional millions, particularly the minimum charges.

The CHAIRMAN. Did you take into consideration in arriving at your cost, the operation of the Government reactors over the past 15 years?

Mr. HAUGH. Yes, sir; we did. May I say this, Mr. Durham, the excellent record that the Government has had in the operation of reactors up to the present time was, I think, the thing that has persuaded the insurance industry as a whole that it should step up and afford this insurance. There is a very remote probability of a catastrophe, but it is a terrific thing if it occurs. Lacking any evidence it would be natural to be inclined to fight shy of it, sir. The excellent record that the Government has established where we have not had, to

my knowledge, in this country a serious incident, and we have had some sizable reactors, and have them going now. For instance, the one at Hanford. It doesn't follow, of course, that there won't be any.

Representative COLE. On the point raised by Mr. Durham, what would the premium be for third-party liability in a powerplant? That is, a conventional powerplant, for a million dollars?

Mr. HAUGH. We don't quote rates in terms of insurance on a powerplant as a rule, but in terms of payrolls. Some of them have long transmission lines, some of them no lines at all, some many substations, some just a plant. It is hard to make a comparison. Let me say, perhaps, on the more nearly comparable, the charges for the catastrophe varies. Within my own organization, sir, as a rule we don't want to hazard a million dollars on such a risk for less than a thousand dollars premium a year. I don't mean on the first million. I mean excess of several million. We would like at least a thousand dollars for every million of insurance we write on such a risk.

The CHAIRMAN. Even for a conventional plant?

Mr. HAUGH. That is right. Some have purchased it for somewhat less. I have seen a quote on one for $700 for a million of insurance in excess of $5 million. I don't care to write it for that. I have to write too many of them for the loss that happens at $700 apiece. I mention that only for the purpose of comparison. Maybe it is some help to you, sir, in indicating the relationship of some of these charges for additional millions to what is more or less current.

Representative COLE. What are the ranges for third-party liability of conventional plants, having in mind a plant of 600 megawatts of heat which has no distribution lines involved?

Mr. HAUGH. You are not talking of a reactor. You mean an orthodox powerplant.

Representative COLE. Yes.

Mr. HAUGH. Liability insurance only, just the plant, no powerlines. You don't mind my saying this is a straight guess, because normally they have lines and auxiliaries and the premium is in one piece. The public has limited access to the plant as they do here. I suppose, and this is a straight guess, if it were located in a sizable city—let us say Chicago, New York, or places of that sort—that it might be $10,000, $12,000. That is a straight guess.

I would like, if you don't mind, to do some checking afterward and drop your committee a note to correct that figure if I am appreciably wrong, if you do not mind my asking for that privilege.

Representative COLE. No.

Mr. HAUGH. I think you want precise information. I am guessing. I would like to correct that either way.

The CHAIRMAN. We would like to have it for the record.

Mr. HAUGH. Yes.

(The information referred to follows:)

COST OF LIABILITY INSURANCE FOR MILLION DOLLAR LIMIT FOR CONVENTIONAL UTILITY GENERATING PLANTS

Premiums for public liability insurance for electric utilities are determined by applying rates to payrolls. In actual practice it was not possible to find an instance where the liability insurance was limited to the generating plant itself since practically all utilities own their own transmission lines, feeder lines, et cetera, and their liability premiums are determined by applying rates to the

total payroll, including plant operating personnel, linemen, meter readers, et cetera.

In an effort to afford the committee some indication of what liability premiums may be developed for a conventional generating plant, I secured estimates of the number of employees at 2 typical plants and assumed an average annual wage of $5,200 per employee. One plant, which has a generating capacity of 235 megawatts, employs approximately 333 people per annum. On the basis of printed manual rates for bodily injury and property damage liability for a combined limit of $1 million, such an operation would develop in Connecticut a premium of $16,208, and in Chicago a premium of $26,909. That particular plant is one which has been in operation for a number of years.

A more modern plant probably would be operated with a smaller number of employees. Some figures obtained for a plant which is currently under construction and is expected to be completed in the near future indicates an expected number of employees of 54 for a plant having a generating capacity of 182 megawatts. On such an operation the premium developed under the same procedure would, for the State of Connecticut, be $2,628, and for Illinois, $4,364.

It should be noted that the premiums to be charged for nuclear energy liability insurance are not in lieu of premiums currently being paid for liability insurance, but are in addition thereto. The existing public liability hazard of utilities continues unchanged, and the construction of a reactor simply adds to the existing liability hazard the additional hazard created by the existence of the reactor.

The foregoing figures of $16,208 and $26,909 are equivalent respectively to 0.013 and 0.022 mills per kilowatt-hour.

Actually, I doubt that the foregoing illustrations are of any particular value because, as previously stated, the rates used are applicable to payrolls of employees engaged, not only in operating the generating plant, but, also, include line crews, maintenance crews, service men, meter readers, et cetera, so that they represent the average public liability hazard of a utility risk and not the public liability hazard of the generating plant alone. Furthermore, as previously mentioned, the premium for nuclear energy liability is the premium charged for an additional hazard which does not currently exist and which does not displace a present hazard, but is in addition to the present hazard.

THE TRAVELERS INSURANCE CO.,
Hartford, Conn.

Mr. GEORGE NORRIS, Jr.,
Counsel, Joint Committee on Atomic Energy,
Room F–88, the Capitol, Washington 25, D. C.

DEAR MR. NORRIS: As I told you the other day on the phone, I was endeavoring to secure through one of the utilities some estimates of the payroll of conventional steam plants for the purpose of seeking to make some sort of rough estimate as to what the general liability premiums of such plants might be for a million-dollar limit if the liability did not extend beyond the generating plant itself; that is, if it excluded transmission lines, meter readings, sales force, clerical force, et cetera.

These figures are purely hypothetical and, as I mentioned to you in our conversation, of no special value because, in practice, the general liability insurance written on risks of this type is not limited to the generating station, and for the further reason that charges to be made for the nuclear energy liability hazard will be in addition to, and not in lieu of, the charges for general liability insurance.

However, for whatever they may be worth, and on the basis of assumed operating payroll, we have calculated that the liability premium for a million-dollar limit in the State of Illinois for a conventional steam plant of 180,000-kilowatt capacity would be approximately $7,000 per year. In the same State, for a conventional steam plant of a capacity of 22,000 kilowatts, we come up with an annual liability premium of $2,500.

Premium charges vary by territory, but if I understand what you are seeking, these figures may give you some indication as to the relative liability costs for conventional plants of these two different capacities.

Sincerely,

CHARLES J. HAUGH,
Vice President.

Representative COLE. Not taking into consideration the hazard of operating powerlines, because that hazard is no greater within an atomic plant than within a conventional plant.

Mr. HAUGH. No. The powerline itself is not, that is right. The members of the public adjacent to the plant are the problem.

Representative COLE. I think it would be helpful if the record could show the rates for third-party insurance for conventional plants.

Mr. HAUGH. You are talking to the same type of insurance here, both bodily injury and damage to property.

Representative COLE. The figure you have given us is out of the air. It is $1,000 a million.

Mr. HAUGH. That is right.

Representative COLE. As against $40,000 that you have assigned for this.

Mr. HAUGH. That is a pure guess, and I would like the opportunity to supply it. I would like to make a note that I am to do that.

I realize that normally utilities will calculate their insurance costs in terms of power output so for whatever it may be worth—it is not in the written statement here—I undertook to determine the cost per kilowatt-hour on this first illustration that I am citing here, assuming their purchase of $50 million of insurance for $250,000, giving no consideration to any potential return afterward at all. That is what I will call the maximum cost.

It is my understanding that utilities ordinarily assume 60 percent of capacity operation. That is the figure I used in making this calculation. I grant you, sir, it would change appreciably if we assumed a higher or lower use of the potential output. I have assumed on this 600-plus megawatts of heat an electrical output of 180,000 kilowatts. On that basis, assuming 60 percent of capacity, it would work out at twenty-six one-hundredths of 1 mill per kilowatt-hour.

The second illustration, I have used a somewhat, but not greatly, smaller reactor in a sparsely populated area, a power reactor of the pressurized water type, 480 megawatts of heat, again assuming it fully contained, and located in a sparsely populated rural area.

Amount of insurance	Annual premium per million of insurance	Total annual premium
First $1,000,000	$20,000	$20,000
Next $4,000,000	10,000	40,000
Next $5,000,000	4,000	20,000
Next $10,000,000	2,000	20,000
Over $20,000,000	1,000	

The annual provisional premium for $50 million of insurance would be $130,000.

Once again that is without consideration of any retroactive return which might ultimately be found to have been earned.

Following a similar procedure in measuring in terms of output and using the same 60 percent of capacity, I calculate that the cost of $130,000 spread over the output would amount to eighteen one-hundredths of 1 mill per kilowatt hour.

Representative COLE. I don't understand the annual provisional premium.

Mr. HAUGH. I say provisional because it is subject, as I mentioned earlier, to this potential retroactive return 10 years hence. If that is not clear, I would like to go into that at some length because I think it is a very important element in this entire rating procedure.

Representative COLE. The retroactive feature does not apply to the base premium.

Mr. HAUGH. Yes.

Representative COLE. It applies to all of them.

Mr. HAUGH. It applies to the entire thing. What we have in mind, and I want to make the record straight on that, Mr. Cole, is that we do not intend to let that retroactive return vary with whether an individual reactor has no losses or a lot of losses, but we are trying to determine whether for this industry in the aggregate the charges are just about right or were more than adequate.

We intend to accumulate the provision in the premiums for losses for 10 years, and compare it with the actual losses for all of those reactors for that 10-year period. If the provision for losses in the premium is more than was needed for losses, we shall make an adjustment on the first year's risks—a percentage reduction applied uniformly to the risks that were insured. A year later, we shall review the most recent 10 years of that period. That has the effect, sir, of having a 10-year moving average accumulation for losses, during the period of time when this industry is largely in the experimental stages. In other words, there are not an extensive number of reactors and we are determining whether we did charge too much, and if so, we will make a retroactive return.

Ultimately, when reactors are in extensive use and we have a lot of insured experience, and we know what happens, we cease to speculate. When we have had hundreds of reactors and their experience, then we probably could abandon that particular retroactive feature. But it seems to us a very equitable procedure to make available to the risks that are being insured.

The CHAIRMAN. Hasn't that been carried in fire insurance, that is, the provisional retroactive features?

Mr. HAUGH. I don't happen to know of it working that way, not to my knowledge, Mr. Durham. I say it in that way because my particular field is casualty insurance, and there may be some features of this kind in fire insurance with which I am not familiar.

Mr. Black will testify later, and I am sure he can answer definitely your statement "Yes" or "No" to that. I think the answer is "No."

The CHAIRMAN. I thought it had been done in automobile liability insurance.

Mr. HAUGH. No. We do have this sort of thing and it is a different arrangement, Mr. Durham. We have what is known as a retrospective rating plan which applies to the experience of the individual risk. It is not providing for overall rating of an industry. It is the experience of an individual risk. That is quite a different sort of thing.

Representative COLE. That does not involve rebates.

Mr. HAUGH. No, it is a straight rating plan definitely provided within the policy. That provides for adjusting premiums within a range specified in the policy to reflect the actual losses on an individual risk after the policy has expired.

Representative COLE. Assume at the end of 10 years there had been no casualties, no losses at all, what would you consider to be an appropriate readjustment?

Mr. HAUGH. I see these reporters writing this down. It is going to be very substantial, Mr. Cole. I don't imagine it will ever come to pass that there will be no losses. But if there were no losses the adjustment would be somewhere between 67 and 75 percent.

Representative COLE. That is between 66 and 75 percent will be returned?

Mr. HAUGH. If there were no losses of any kind.

Representative COLE. Will be returned to the insurer or retained by the pool?

Mr. HAUGH. Would be returned to the insured, the people that paid the premium. These are adjustments with the policyholders, the people that pay the premium.

I want to stress I don't expect any return as substantial as that, but your question is illustrative of the potential range.

Representative COLE. Assume that your losses at the end of 10 years have amounted to 50 percent of the premiums that have been paid, what would you consider to be a fair or appropriate return?

Mr. HAUGH. I would say on that, that the return would be somewhere between a sixth and a quarter of the premium.

Representative COLE. And if 75 percent of the fund is exhausted in paying claims, there probably will be no return.

Mr. HAUGH. That is right, sir.

Representative COLE. I just wanted to get some idea of what we might anticipate.

Representative JENKINS. May I ask one question, Mr. Chairman?

The CHAIRMAN. Yes.

Representative JENKINS. In your first paragraph you say:

> Nuclear Energy Liability Insurance Association is an organization of some 135 capital stock insurance companies.

Let me ask you about what proportion of the insurance companies are included?

Mr. HAUGH. From the point of view of potential capacity, it is the vast majority of them. It is not all of the companies. Perhaps I could answer it best by explaining very briefly how this was set up, Mr. Jenkins. You don't mind my taking the time to do that?

Representative JENKINS. No; I would like to have you do it.

Mr. HAUGH. When the syndicate was being organized we invited every stock casualty company rated by Best, which is an organization that rates insurance companies nationwide on the basis of their financial statement. That included some very, very small ones. We invited all of them to participate. All of them did not elect to participate. That is quite understandable. But we wanted to get as much capacity as we could. Having gotten them in we asked them to indicate the extent to which they were willing to participate. The vast majority of the companies indicated a willingness to participate, each for from $25,000 or more. Their participation ranges from $25,000 up to a maximum of $3.5 million for an individual company. I think this is in the testimony of a previous hearing. I think there were not over a half dozen companies that indicated a willingness to participate but set a figure of less than $25,000. Of those half dozen—I

think I am right within 1 company, at least 3 of them came back and said they would be willing to push theirs up to 25. So we set a minimum participation of $25,000 for a company. It now includes almost all of the sizable stock companies who write casualty insurance and are licensed in the United States. Offhand I can think of only one exception of a sizable one. They may have very good reason for not being in. I think only one of the sizable companies doing a business in a number of States—not just in a limited area—is not in it.

Representative JENKINS. That is very encouraging.

Mr. HAUGH. It is, sir.

Representative JENKINS. Everybody agrees that the insurance business is a great business. With these new propositions that are coming along, it argues well for you if you had a fair representation. Nobody would expect you to have a full 100 percent.

Mr. HAUGH. No. I might say this: I don't want this to look just as though it was a stock organization only. May I say the mutual companies and their organizations followed a generally similar procedure, I believe with equally successful results.

Representative JENKINS. That is all, Mr. Cairman.

Mr. HAUGH. In the third illustration I have used a small reactor. This is a power reactor of the boiling-water type, 58 megawatts of heat, fully contained, located in sparsely populated rural area.

May I say, first, there is a typographical error here? Where it says first million, $17,360, will you strike out the "1"? It should be $7,360.

Amount of insurance	Annual premium per million of insurance	Total annual premium
First $1,000,000	$7.360	$7,360
Next $4,000,000	3,680	14,720
Next $5,000,000	1,470	7,350
Over $10,000,000	1,000	

The annual provisional premium for $50 million of insurance would be $69,430.

You may say we are getting very technical, quoting premiums to the nearest $10, but we worked this out letting the decimals fall where they will.

Representative COLE. Is there any ceiling on the amount of insurance a person may take?

Mr. HAUGH. Yes, sir; there is. The stock company syndicate to which I am speaking particularly has a maximum capacity of $50 million. The mutual syndicate for liability insurance has a potential capacity of $10 million. So the maximum potential liability insurance capacity is $60 million. I used $50 million here because it happened to be for my own syndicate. I did it for the purpose of illustration and used the same amount each time for comparative purposes.

The CHAIRMAN. What does that work out per mill per kilowatt?

Mr. HAUGH. On the same 60 percent operating capacity, it works out six-tenths of a mill per kilowatt hour.

I may mention that I used 22 megawatt electrical capacity related to that 58 megawatts of heat. For these illustrations I took them out

of a published exhibit that mentions capacities and just using those for illustration I use them here. That is based upon an assumed electrical capacity of 22 megawatts.

The CHAIRMAN. I was thinking about that because I believe that is comparable to the Elk River cooperative plant that they are trying to build.

Mr. HAUGH. I think in general terms that is right, sir. I was interested in that particular one to determine the effect of change in potential use. I have no idea whether in these smaller plants the potential use over a year is greater or less than in these large urban areas. I don't know enough about the industry to know. I would think almost any plant must be used over a year to 60 percent capacity. I worked this out to 80 percent to see what happened. That changes from six-tenths of a mill to 45/100ths of a mill.

The CHAIRMAN. Since we asked you a few minutes ago to supply for the record the cost of third-party liability, would it be too much inconvenience to give us some figures for the record on a cost per kilowatt cost per hour?

Mr. HAUGH. I will endeavor to do that. It will be on some judgment figures, but I will be glad to furnish them to you.

The CHAIRMAN. Thank you.

(The information referred to was not received at the time of printing. When received it will be filed with the Joint Committee.)

Mr. HAUGH. The fourth illustration I used is not a power reactor, because there are also involved research and testing reactors. For the fourth illustration I used a research reactor of the aqueous homogeneous type, less than one megawatt of heat, fully contained, located in an urban area, that is, a large city.

Amount of insurance	Annual premium per million of insurance	Total annual premium
First $1,000,000	$12,000	$12,000
Next $4,000,000	4,000	16,000
Next $5,000,000	1,600	8,000
Next $10,000,000	800	8,000
Over $20,000,000	500	

The annual provisional premium for $50 million of insurance would be $59,000.

May I refer to a statement cited earlier? In research reactors the charge for the first million is computed somewhat differently because research reactors have a somewhat greater public exposure. By that I mean individual members of the public. People not employees of the reactor have much more ready access. They are in there participating in experiments, participating in testing of materials. There are also portholes in a research reactor that are open for testing purposes, and more readily accessible, and may more readily cause injury to an individual. I am not talking of a catastrophe now, but to an individual. There may be students in there. There may be faculty members from other institutions there. There are more members of the public. So that in the first million there is an additional supplemental charge, but that is not carried through into the charges for the

increased millions. In other words, it does not accumulate for the additional millions.

In this particular one, the $12,000 is made up of $8,000 plus $4,000 supplemental charge. So that the charge for each million in excess of the first—each of the $4 million in excess of the first is $4,000. It is not 50 percent of the $12,000. It is 50 percent of the $8,000. Then the charge for additional millions above that is always related to that base excluding the supplemental charge.

You will notice that over $20 million this comes down and strikes the minimum charge per million dollars of $500. That is a premium charge of $500 for a million dollars of coverage. In this one it works out in excess of $20 million.

The premium for a reactor of this type for $50 million of coverage would work out to $59,000.

Representative COLE. Tell me what happens if you have a real bangup catastrophe and the amount of damage is $50 million. A month or so later there is another one. What protection does the second one have?

Mr. HAUGH. I think I understand your question, sir. The policy provides this. We assume the policy has been written for $50 million of liability insurance on a reactor. The policy provides that there is insurance for $50 million—not per incident, but total amount of insurance—as losses incur the amount of insurance is reduced by the amount of the loss. It is not automatically reinstated. It may be reinstated upon submission and a review of the risk and a proper determination. If it is reinstated there is an additional premium charge. If an incident occurred and it was $50 million—I hope we don't have to decide that issue too early in the proceedings after these things get in operation—presumably the reactor as such is out of operation for the time being. If there were a loss that happened that caused $50 million of damage then, it is not going to be operated for some time.

Representative COLE. How about another reactor?

Mr. HAUGH. It doesn't affect another reactor's insurance one iota. For the sake of discussion we have 10 reactors insured, and there are 10 different locations, and they are unrelated. One of them goes and causes $50 million damage, the other 9 still have their $50 million insurance.

Representative COLE. Even though the original capital or investment or participation is exhausted?

Mr. HAUGH. Yes, sir. The losses on reactor A do not in any way adversely affect the insurance of reactors B, C, D, ad infinitum.

Representative COLE. I don't understand, and it is understandable that I would not, because insurance is a rather technical field, but I got the idea that this pool was a participating pool of a number of insurance companies, each of which have indicated a readiness of participate for from $25,000 to $3.5 million.

Mr. HAUGH. That is right.

Representative COLE. Does that mean that those constituent companies put in as capital $25,000 to this association?

Mr. HAUGH. No, sir.

Representative COLE. Does it mean that the $25,000 is the extent of the liability of that one company?

Mr. HAUGH. On each risk in each policy. It is the extent of their liability on each policy. I think that clears it up.

Representative COLE. I see.

Mr. HAUGH. They authorize that association to commit them for not more than that amount on whatever policies they issue.

Representative COLE. This is not an insurance pool to cover atomic activities.

Mr. HAUGH. Yes, it is.

Representative COLE. Not as a pool. It is an aggregation of insurance companies that are ready to pledge themselves to indemnify each reactor to the extent of $50 million.

Mr. HAUGH. That is right, sir. It is a syndicate of companies. The policy in effect has on it the names of the one hundred and thirty-five-odd companies, each saying our proportion is so much of the total amount in the policy. Each policy thereon is for the same proportion.

Representative COLE. The liability of the constituent companies would be proportionate to their interest in the syndicate.

Mr. HAUGH. That is right. For instance, if the policy were only $1 million, they would have a proportionate share of the $1 million.

Representative COLE. And if the losses of that one policy were $250,000, their contribution would be proportionate to their participation.

Mr. HAUGH. That is right, sir.

May I repeat, the provisional premium charges applicable to any given reactor will be based upon a consideration of the conditions peculiar to that reactor. All provisional premium charges will be subject ultimately to a retroactive reduction in the event the losses industrywide prove to be materially less than contemplated.

On behalf of my colleagues, as well as myself, I thank you for this opportunity to present this report.

The CHAIRMAN. Thank you very much, Mr. Haugh.

Mr. Ramey, do you have some questions?

Mr. RAMEY. No.

The CHAIRMAN. Mr. Cole, do you have any questions?

Representative COLE. I have been wondering what would be the position of a reactor owner who felt that the premiums that you have arbitrarily assigned to his operation were excessive or unreasonable. There is no other place he can go, is there?

Mr. HAUGH. That is right.

Representative COLE. If I don't like your rates, I will go across the street and talk to somebody else.

Mr. HAUGH. That is right.

Representative COLE. In this case he is helpless. It is either that or nothing.

Mr. HAUGH. That is a perfectly legitimate comment. May I answer that, sir? In the first place, all of the rates are subject to the State rating laws. I would be the first one to admit that the State insurance departments have no more information than we do or than you do or others do as to precisely what the premium charge should be for each specific reactor. It is for that reason in developing this rating procedure—and that is why I have stressed, I hope not unduly, this retroactive adjustment—it is for that reason in the rating procedure we have incorporated a provision that it seems to us is a very,

very fair answer to any industry that says, "Well, but it may ultimately be proved that it is far more than you need." We intend to make it part of our contract that if it is, this is the way it will be adjusted. They have to give us some time to accumulate some experience on this thing.

It seems to us that the answer is this: In order to accumulate the tremendous capacity that is needed to afford these very high limits, the companies must act in concert. That being true, there cannot be a multiplicity of markets. There are definite provisions in the rating laws of the country to provide joint underwriting syndicates such as this for that very reason. In the field of property insurance generally, where there are very large values insured—for fire insurance and that sort of thing—there are and have been for years syndicates in these United States. It is necessary to assemble vast capacities of insurance.

The statute which is under consideration—both the House and Senate bill, S. 715 is the one I remember here, although the House bill is identical—provides for establishing financial responsibility. It contains a provision as I read it that this may be through the medium of insurance or presumably it might be through the medium of securities if an organization elected to demonstrate its financial responsibility otherwise. In some other lines of business that is done, such as workmen's compensation, by putting up securities. I would not expect that many companies would care to put up actual financial guaranties. But I must confess, sir, that in the light of all the hazards that are involved, the uncertainties that are involved, and the procedures that we have established, I hope I am not being prejudiced in saying I think we have come up with a rating procedure that cannot legitimately be protested by the potential purchasers as producing excessive charges, bearing in mind the potential retroactive adjustment based upon what actually will happen.

Representative COLE. It is probably very unlikely that this may happen in the next 10 or 15 years, but is it possible from a legal standpoint for State insurance policies to upset your procedures for establishing the rates?

Mr. HAUGH. It is possible. Of course that is a possibility. An individual State might say we won't approve it. I should mention this, however. This has been filed in all the States requiring filing, and it has not been upset in any of them. We have actually made the filings.

Representative COLE. If it is done, then it will mean another rate.

Mr. HAUGH. Yes. We will then have to find some other rating procedure if they upset this retroactive provision. I don't know what we would do.

Representative COLE. There is only one other phase I would like to explore. Why do you think it is not advisable to have a retroactive adjustment for a company?

Mr. HAUGH. For each individual reactor?

Representative COLE. Yes.

Mr. HAUGH. Because, sir, it would defeat the whole thing. None of us expects any degree of frequency of catastrophic losses in this, either we in the insurance business or I am confident you gentlemen or the people in the utility industry. If by some chance one happens

and it is a tremendous thing, it is going to be largely fortuitous whether it is one that happened to me or to you or to the next man. We are undertaking in this procedure to in effect accumulate what amounts to a revolving 10-year fund. It is not going to be large enough to take care of a maximum loss but it is a revolving fund for all the risks.

Representative COLE. If there were an individual rebate process that would tend to encourage the owner to select the type which is the most safe, secure and foolproof, whereas if everyone is benefitted by a rebate, then they would be inclined to be more careless in the selection as well as the operation.

Mr. HAUGH. That might be. I would think there is another even more compelling reason why each of these utilities or public authorities operating a reactor want to do the very best they can to avoid this. It is a matter of public relations. I was quite interested here, and I am sure you will recall it at a hearing a year ago when Mr. Searing of Consolidated Edison said, "My industry is dependent upon good public relations. If my industry does something that does terrific damage to the general public who are all of my customers in that area, it is just going to ruin me anyway." I would think any utility would look at it that way, and everyone is doing their best, including the AEC in their regulation. Certainly the insurance companies are trying to do their best to make certain that there is never such an incident.

Representative COLE. There are varying degrees of bestness, are there not?

Mr. HAUGH. I agree.

The CHAIRMAN. Would this insurance cover hospitals handling radiation hazards?

Mr. HAUGH. If we are talking about using isotopes for treatment, we cover that under our normal liability contracts.

The CHAIRMAN. You do?

Mr. HAUGH. Yes, sir. If they had a facility of some sort that actually fell into this category, it would be available. We propose to make this available to anybody who has a reactor, critical assembly, fuel processing or reprocessing plant, and things that are directly related to reactors.

The CHAIRMAN. If you had an accident and it released a large amount of radiation from the plant, would it cover the fallout in some other State?

Mr. HAUGH. It covers the liability of the plant arising out of the operation of that reactor whatever State the claim might arise in. It is very broad.

Representative COLE. Does it cover a claimant living in a foreign country?

Mr. HAUGH. Living in a foreign country at the time he is injured?

Representative COLE. No, who is injured.

Mr. HAUGH. Who is injured in a foreign country?

Representative COLE. Does it cover an alien who is damaged?

Mr. HAUGH. An alien not in the United States?

Representative COLE. That is right, somebody in Mexico or Canada?

Mr. HAUGH. The policy as it is written is limited to the United States and its possessions. If we would extend it beyond that we would have to endorse it.

Representative COLE. The claimants.

Mr. HAUGH. Let us assume a policy—you say Mexico or Canada, either way—the policy as written is limited to the United States. But if we had a reactor along the border, in my book we would endorse the policy to cover claimants across the border.

Representative COLE. How far away?

Mr. HAUGH. Canada or Mexico.

Representative COLE. How far across the border?

Mr. HAUGH. It has not come up but as far as I am concerned would cover Canada. That is larger than the United States. I rather imagine the Canadian people perhaps are going to—they have not yet done it—undertake to set up a facility somewhat such as I have talked of here in the United States for Canadian reactors. Your point has to do with a reactor here and extending across to Canada

Representative COLE. I think we will do pretty well if we successfully protect the American people and property owners in this country without worrying about those that live abroad.

Mr. HAUGH. I think so. I am thinking of the liability of the reactor operator, he having a liability to others. That is what he is thinking of basically. He wants to protect his liability in the event the general public is injured. Using our automobile contract, normally we cover United States and Canada. We can't cover in Mexico. You have queer laws in Mexico.

Representative COLE. Are our courts available to a litigant abroad in Mexico or Canada?

Mr. HAUGH. If they bring a suit in this country, they are. If they bring the claim in this country. I am not talking to this, but other operations. Sometimes you may have an instance where something happens out of the country and a suit is brought in the United States on that. We would afford coverage for that.

The CHAIRMAN. Mr. Price.

Representative PRICE. Mr. Chairman, I am at a disadvantage because I attended two other meetings before I arrived here, so I do not know what questions have been asked. I am particularly interested however in knowing whether any individual company or whether the syndicate has ever requested the Reactor Safeguards Committee reports.

Mr. HAUGH. We have not asked for reactor safeguard reports as such, so far as I know. We have asked for information pertaining to hazards evaluation reports. What we undertake to do is to ask our potential insured whether it be a utility or university with a research reactor or whoever it may be, for all the information that is available to them with respect to the hazards evaluation, to the site survey, to their engineering plans and any other information they have with respect to their reactor. We would like to have available to us every bit of information that we can get anywhere that pertains to the reactor hazard. What we ask our potential insured to do, there is this hazard evaluation report that goes into some detail—we want to have access to that—and we ask them for authorization to see that. We look to our insured to give us authorization to have access to all the material that he may have with respect to this.

Representative PRICE. Would that include recommendations from the Reactor Safeguards Evaluation Committee?

Mr. HAUGH. I would think it does not. That is not in the hazards evaluation report. I don't think that is part of the hazards evaluation report. Their recommendation which is really their actual report—I understand they make a written report to the General Manager of the AEC—as far as I know is not available to the risk. If it is, we would like to see it. If the risk can get it—the risk being the utility or reactor operator—if they can have it, we want to see it.

The CHAIRMAN. You think it would be a good thing for you to have?

Mr. HAUGH. We would like to see everything that relates to hazards. The more we learn about the potential hazards on the risk, the happier we are. We want to know all we can about it.

Representative PRICE. Have you explored the availability of such reports to your people?

Mr. HAUGH. We have done this. We have asked members of the staff of the AEC, can we have access to material that is available to the insured. Their answer has been "Yes." We have not asked them for copies of any material that they don't generally make available. We have said if there is anything other than what is currently available that affects the hazard we would like to be acquainted with that. If it is in a report that they feel should not be made available to us, we have no quarrel so long as they are willing to tell us what is in there that might affect the hazard.

For instance, I understand there may have been instances where—it is a queer term—there may be a trade secret. Someone in working out his process or procedure does not want any of his competitors to know how he is working something out. If it does not affect the hazard, I have no complaint about being told you cannot see it, or have any part of it. So long as I can be advised of all the information that is available relating to the hazard as such, that is all I can legitimately ask for.

Representative PRICE. I understand there was an attached paper that accompanied the request for inspection by the inspection committee of the Mutual Atomic Energy Insurance Pool, the group you represent——

Mr. HAUGH. Mine is a stock company organization. There was reference to that, sir, yesterday, and if you don't mind, would you ask that of Mr. Yount, who will follow me? He is representing the Mutual Atomic Energy Pool. I am the stock company representative.

Representative PRICE. You are familiar with this?

Mr. HAUGH. Only to the extent that it was mentioned yesterday.

Representative PRICE. Does your group do anything like that with respect to this same information?

Mr. HAUGH. What I asked for is what I recited. I did not see that. I wonder if that is not really what it was intended to be—to ask the assured to authorize us to secure or to be furnished a copy of or have access to a copy of the hazards survey, the hazards evaluation, site survey, and the engineering plans to the extent that they are available to the insured. If they will give us authority to do that, that is all we need. I think that really is what was intended in that. I would guess that is what was intended, sir.

Representative PRICE. That is all I have, Mr. Chairman.

The CHAIRMAN. Could we have what Mr. Price. asked for for the record?

Mr. HAUGH. Yes. Let me see if I have an exact copy here. Could I send it to you? I seem to have a little trouble fishing it out here.

The CHAIRMAN. Yes. Do you have a copy of the policy that you can supply for the record?

Mr. HAUGH. Yes, sir, a copy of the policy and a copy of our request for inspection material.

(The information referred to follows:)

REQUEST FOR INSPECTION BY THE ENGINEERING AND INSPECTION COMMITTEE OF THE NUCLEAR ENERGY LIABILITY INSURANCE ASSOCIATION

DISTRIBUTION

2 cc. Eng. and Insp. Committee.
1 cc. Association Und. Committee.
1 cc. Requesting officials.

Applicant for insurance_____ Address_____
Facility owner_____ Address_____
Name of facility_____ Address_____
Contact at plant_____ Title_____
Initiating carrier_____
Description of property_____
_____
Character of operation_____
Type of coverage requested_____ Limits of coverage (dollars)_____
Date coverage needed_____
Present status of project_____ Estimated completion date_____
Remarks or special instructions_____
_____
_____

ATTACHMENTS

Hazards evaluation report (if not available indicate how association committee can obtain)_____ ☐
Site survey plan_____ ☐
Engineering description of project__ ☐
Letter of authorization_____ ☐
Date request received_____
Date inspected_____
Date report received by committee_____
_____
Names of inspectors_____
_____

_____ _____
(Name and title of official requesting inspection) (Date)

(NOTE.—Please read instructions before filling out form.)

REQUEST FOR INSPECTION BY THE ENGINEERING AND INSPECTION COMMITTEE OF THE NUCLEAR ENERGY LIABILITY INSURANCE ASSOCIATION

INSTRUCTIONS

Applicant for insurance: Name of the prospective purchaser of insurance coverage in NELIA.

Facility owner: Name of the company owning the installation. This may or may not be the same as that under the previous heading.

Name of facility installation: Most facilities now being proposed have been given a place name or an institution name. If the installation in question has such a name, please designate.

Contact at plant: Name and title of individual in the applicant's employ who can provide all necessary technical information to the Inspection Committee.

Initiating carrier: Name of carrier requesting inspection. This company must be a member of NELIA. The request should be signed by a responsible officer of the company.

Description of the property to be insured: This should be brief and include the number and types of buildings; the area of the plant site; description of the surrounding area with special reference as to the population distribution, surrounding property and its nature.

Character of operation: A brief description of the type of installation. Indicate whether this is a reactor, fuel fabricator or fuel reprocesser. In addition, type of reactor should be stated as well as its intended use and rated power.

Type of coverage requested: Indicate all coverages desired whether workmen's compensation, liability, and damage to premises; including boiler and machinery.

Limits of coverage: State the dollar value of the policy limit requested.

Date coverage needed: This should be the effective date of the policy.

Present status of project: This should include a statement as to whether the project is in the blueprint stage, under construction, etc. Information should also be provided as to the status of the AEC construction permit or license.

Estimated completion date: This is the estimated date on which construction should be completed and operations begun.

Remarks and special instructions: Include here any pertinent information which will assist the inspection committee in making its contacts to inspect with a minimum of delay.

ATTACHMENTS

Hazards evaluation report: Each installation at the present time must obtain approval from the Division of Civilian Applications of the AEC. In order to obtain this approval a detailed report must be submitted outlining the nature of the installation and its surroundings as well as the steps which have been taken to assure its safety. It is essential that the Inspection Committee have available for its consideration a copy of the report to the Hazards Evaluation Staff. This can be obtained with the approval of the company which makes the reporrt. Therefore, the carrier requesting this inspection should make the necessary arrangements with the applicant for insurance to obtain a copy of the Hazards Evaluation Staff report. If possible, this copy should be appended to this questionnaire.

Site survey plan: The Inspection Committee will need for its consideration a plot plan of the site of the installation to be insured as well as plans showing the nature of the surrounding areas. These should either be provided with this questionnaire or provision made for supplying them to the committee unless included in the Hazards Evaluation Committee report.

Description of project: Detailed information as to all of the operations involved in the project to be insured should be supplied by the carrier initiating this request. This information can be obtained from the applicant.

Letter of authorization: This request for inspection should be accompanied by a letter of authorization signed by an officer of the company to be insured. This letter should authorize members of the NELIA Engineering and Inspection Committee to confer with the Division of Civilian Applications or other AEC divisions, if needed, concerning the installation to be insured. In this letter, the applicant should agree to supply a copy of the Hazards Evaluation Committee report. The purpose of this letter of authorization is to guarantee the complete cooperation of the applicant in the activities of the Engineering and Inspection Committee.

NOTE.—The information requested in the lower right hand corner is for the use of the Inspection Committee only.

NUCLEAR ENERGY LIABILITY POLICY

March 1, 1957, Edition

The undersigned members of the Nuclear Energy Liability Association, hereinafter called the "companies," each for itself, severally and not jointly, and in the respective proportions hereinafter set forth, agree with the insured, named in the declarations made a part hereof, in consideration of the premium and in reliance upon the statements in the declarations and subject to the limit of liability, exclusions, conditions, and other terms of this policy:

INSURING AGREEMENTS

I. Bodily injury and property damage liability

To pay on behalf of the insured—

(*a*) all sums which the insured shall become legally obligated to pay as damages because of—

1. bodily injury, sickness, or disease, including death resulting therefrom, hereinafter called "bodily injury," sustained by any person; and

2. physical injury to or destruction or radioactive contamination of property, and loss of use of property so injured, destroyed, or contaminated, and loss of use of property while evacuated by order of public authority because of possible contamination, hereinafter called "property damage"; caused by the nuclear energy hazard;

and the companies shall defend any suit against the insured alleging such bodily injury or property damage and seeking damages which are payable under the terms of this policy; but the companies may make such investigation, negotiation, and settlement of any claim or suit as they deem expedient;

(*b*) costs taxed against the insured in any such suit and interest on any judgment therein;

(*c*) premiums on appeal bonds and on bonds to release attachments in any such suit, but without obligation to apply for or furnish such bonds; and

(*d*) expenses incurred by the insured for such immediate medical and surgical relief to others as shall be imperative at the time of the nuclear incident; and reasonable expenses, other than loss of earnings, incurred by the insured at the companies' request.

II. Definitions

Wherever used in this policy—

(*a*) The term "the facility" means the facility described in the declarations and includes all premises and operations which are related to said facility and which are at the location designated in item 3 of the declaration.

(*b*) The terms "source material," "special nuclear material," and "byproduct material" shall have the meanings given them in the Atomic Energy Act of 1954, or in any law amendatory thereof.

(*c*) The term "nuclear energy hazard" means the radioactive, toxic, explosive or other hazardous properties of source material, special nuclear material or byproduct material, but only with respect to (1) the handling, disposal, or use of such materials (other than transportation of such materials off the location designated in item 3 of the declarations) in connection with the ownership, construction, maintenance, operation, or use of the facility; or (2) the transportation, including the handling or storage incidental thereto, of such materials shipped (a) from the facility, or (b) to the facility from the United States of America or any agency thereof.

(*d*) The term "nuclear incident" means an occurrence which results in bodily injury or property damage caused by the nuclear energy hazard.

(*e*) The term "utilization facility" means any facility required by law to be licensed as such by the Atomic Energy Commission and includes the site on which such facility is located together with all premises used by and all operations related to such facility.

(*f*) The term "production facility" means any facility required by law to be licensed as such by the Atomic Energy Commission or any equipment designed or used for the processing, fabricating, or alloying of special nuclear material and includes the site on which such facility or equipment is located together with all premises used by and all operations related to such facility or equipment but does not include any equipment, premises, or other property owned by the United States of America or any agency thereof.

III. Definition of insured

The unqualified word "insured" includes—

(*a*) the name insured;

(*b*) any person or organization as owner or lessor of premises occupied or used by the named insured for the construction, maintenance, operation, or use of the facility;

(*c*) any person or organization with respect to his or its operation or use of the facility with the permission of the named insured;

(*d*) any person or organization with respect to the furnishing of services, materials, parts or equipment in connection with the planning, construction, maintenance, operation, or use of the facility; and

(*e*) with respect to any nuclear incident occurring away from the location designated in item 3 of the declarations or away from any other production or utilization facility and in the course of transportation of source material, special nuclear material or byproduct material shipped from the facility or shipped to the facility from the United States of America or any agency thereof,

(1) any person or organization to which such material is consigned, or

(2) any common or private carrier for hire by automobile transporting such material, any employee, partner, director or stockholder of such carrier while acting within the scope of his duties as such, and any other person or organization legally responsible for such transportation by automobile.

Subdivisions *b*, *c*, *d*, and *e* above do not include as an insured the United States of America or any of its agencies or employees. With respect to any nuclear incident occurring away from the location designated in item 3 of the declarations, subdivision *d* does not include as an insured any common carrier or private carrier for hire or any employee, partner, director, or stockholder of such carrier while acting within the scope of his duties as such. With respect to any nuclear incident occurring at the location designated in item 3 of the declarations, subdivision *d* includes as an insured any common or private carrier for hire by automobile and any employee, partner, director, or stockholder of such carrier by automobile while acting within the scope of his duties as such, but does not include as an insured any other common or private carrier for hire.

This insuring agreement does not apply to any employee with respect to bodily injury to another employee of the same employer injured in the course of such employment.

Subject to condition 3 and the other provisions of this policy, the insurance applies separately to each insured against whom claim is made or suit is brought.

IV. Application of policy

This policy applies only to bodily injury or property damage—

(1) which results from nuclear incidents occurring during the policy period, and

(2) which is discovered, and for which written claim is made against the insured, not later than 2 years after the end of the policy period.

EXCLUSIONS

This policy does not apply—

(*a*) to any obligation for which the insured or any carrier as his insurer may be held liable under any workmen's compensation, unemployment compensation or disability benefits laws, or under any similar law;

(*b*) except with respect to liability of another assumed by the insured under contract, to bodily injury to any employee of the insured arising out of and in the course of his employment by the insured;

(*c*) to liability assumed by the insured under contract, other than the liability of another which would be imposed by law on such other in the absence of an express assumption of liability;

(*d*) to bodily injury or property damage due to the manufacturing, handling, distribution, or use by the insured, in time of peace or war, of any weapon or other instrument of war;

(*e*) to bodily injury or property damage due to war, whether or not declared, civil war, insurrection, rebellion, or revolution, or to any act or condition incident to any of the foregoing;

(*f*) to property damage to (1) the facility, (2) premises owned by, rented to or occupied or used by any insured for the construction, maintenance, operation or use of the facility, (3) any property on such premises, or (4) any source material, special nuclear material or byproduct material in the course of transportation or the handling or storage incidental thereto; or

(*g*) to any nuclear incident—

(1) arising out of source material, special nuclear material, or byproduct material while located, transported, handled or used outside the territorial limits of the United States of America, its Territories or possessions;

(2) occurring at any production or utilization facility other than the facility described in the declarations;

(3) arising out of special nuclear material or byproduct material retained by the insured and used for any purpose other than the operation or use of the facility, if the bodily injury or property damage occurs after arrival of such material at any premises owned, occupied, or used by the insured, other than the location designated in item 3 of the declarations;

(4) arising out of special nuclear material or byproduct material contained in or combined with special nuclear material sold or distributed by any insured to any person or organization other than the facility, the United States of America or any agency thereof, if the bodily injury or property damage occurs after arrival of such material at the premises designated by such person or organization;

(5) arising out of byproduct material, except byproduct material contained in or combined with special nuclear material, sold or distributed by any insured to any person or organization other than the facility, any other production or utilization facility, or the United States of America or any agency thereof, if the bodily injury or property damage occurs away from the location designated in item 3 of the declarations;

(6) arising out of special nuclear material or byproduct material sold or distributed by any insured to the United States of America or any agency thereof, if the bodily injury or property damage occurs after delivery of such material at any premises of the United States of America or any agency thereof, or after arrival of such material at any other premises where it is to be delivered; or

(7) occurring during the course of transportation of source material, special nuclear material or byproduct material unless such material—

(*a*) is being transported from the location designated in item 3 of the declarations for disposal as waste or was shipped from such location and thereafter no additional such material was received by the transporting conveyance; or

(*b*) is in the course of transportation from the United States of America or any agency thereof to the location designated in item 3 of the declarations and such location is the next scheduled location for delivery of such material.

CONDITIONS

1. Premium

The named insured shall pay the companies the premium, as stated in the declarations, for the period from the effective date of the policy through December 31 following. Thereafter, at the beginning of each calendar year while this policy is in force, the named insured shall pay the premium for such year to the companies.

The premium for each calendar year shall be computed in accordance with the companies' rules, rates, rating plans, premiums, and minimum premiums applicable to this insurance and shall be as stated in a written notice given by the companies to the named insured as soon as practicable prior to or after the beginning of such year; provided, if while this policy is in force any alteration in the facility or change in the operations conducted at the location designated in item 3 of the declarations shall increase the nuclear energy hazard, the named insured shall pay the companies an additional premium from the inception of such increase in hazard, computed in accordance with the companies' rules, rates, rating plans, premiums, and minimum premiums applicable to this insurance. Any addition to the facility, or any increase in the capacity of the facility or in the amount of special nuclear or byproduct material regularly stored at, used by, or shipped from the facility, shall be deemed to increase the nuclear energy hazard.

The named insured shall keep a record of the operations conducted at such location and shall notify the companies as soon as possible of any alteration in the facility or change in the operations which results in increasing the nuclear energy hazard, but failure to give such notice shall not invalidate this insurance.

2. Inspection; suspension

The companies shall be permitted to inspect the facility and to examine the insured's books and records at any time, as far as they relate to the subject matter of this insurance. If a representative of the companies discovers a condition with respect to the nuclear energy hazard which he believes to be unduly dangerous, a representative of the companies may request that such condition be corrected

without delay. In the event of noncompliance with such request, a representative of the companies may, by written notice to the named insured, immediately suspend the insurance. A copy of such notice shall be sent promptly to the Atomic Energy Commission. The insurance so suspended may be reinstated by the companies by an endorsement issued to form a part of this party.

3. Limit of liability; termination of policy upon exhaustion of limit

Regardless of the number of persons and organizations who are insureds under this policy, and regardless of the number of claims made and suits brought against any or all insureds because of one or more nuclear incidents during the policy period, the limit of liability stated in the declarations is the total aggregate liability of the companies for their obligations under this policy and the expenses incurred by the companies in connection with such obligations, including—

(*a*) payments in settlement of claims and in satisfaction of judgments against the insureds for damages because of bodily injury or property damage, and payments made under parts B, C, and D of insuring agreement I;

(*b*) payments for expenses incurred in the investigation, negotiation, settlement, and defense of any claim or suit, including, but not limited to, the cost of such services by salaried employees of the companies, fees and expenses of independent adjusters, attorneys' fees and disbursements, expenses for expert testimony, inspection and appraisal of property, examination, X-ray or autopsy, or medical expenses of any kind;

(*c*) payments for expenses incurred by the companies in investigating a nuclear incident or in minimizing its effects.

Each such payment made by the companies shall reduce by the amount of such payment the limit of the companies' liability under this policy.

If, during the policy period or subsequent thereto, the total of such payments made by the companies shall exhaust the limit of the companies' liability under this policy, all liability and obligations of the companies under this policy shall thereupon terminate and shall be conclusively presumed to have been discharged. This policy, if not theretofore canceled, shall thereupon automatically terminate.

Regardless of the number of years this policy shall continue in force and the number of premiums which shall be payable or paid, the total aggregate liability of the companies shall be the limit of liability stated in the declarations and shall not be cumulative from year to year.

4. Notice of occurrence, claim, or suit

In the event of bodily injury or property damage to which this policy applies or of an occurrence which may give rise to claims therefor, written notice containing particulars sufficient to identify the insured and also reasonably obtainable information with respect to the time, place and circumstances thereof, and the names and addresses of the injured and of available witnesses, shall be given by or for the insured to the Nuclear Energy Liability Insurance Association or the companies as soon as practicable. If claim is made or suit is brought against the insured, he shall immediately forward to the Nuclear Energy Liability Insurance Association or the companies every demand, notice, summons or other process received by him or his representative.

5. Assistance and cooperation of the insured

The insured shall cooperate with the companies and, upon the companies' request, attend hearings and trials and assist in making settlements, securing and giving evidence, obtaining the attendance of witnesses and in the conduct of any legal proceedings in connection with the subject matter of this insurance. The insured shall not, except at his own cost, make any payment, assume any obligation, or incur any expense other than for immediate medical and surgical relief to others as shall be imperative at the time of the nuclear incident.

6. Action against companies

No action shall lie against the companies or any of them unless, as a condition precedent thereto, the insured shall have fully complied with all the terms of this policy, nor until the amount of the insured's obligation to pay shall have been finally determined either by judgment against the insured after actual trial or by written agreement of the insured, the claimant and the companies.

Any person or organization or the legal representative thereof who has secured such judgment or written agreement shall thereafter be entitled to recover under this policy to the extent of the insurance afforded by this policy.

No person or organization shall have any right under this policy to join the companies or any of them as parties to any action against the insured to determine the insured's liability, nor shall the companies or any of them be impleaded by the insured or his legal representative. Bankruptcy or insolvency of the insured or of the insured's estate shall not relieve the companies of any of their obligations hereunder.

7. Subrogation

In the event of any payment under this policy, the companies shall be subrogated to all the insured's rights of recovery therefor against any person or organization, and the insured shall execute and deliver instruments and papers and do whatever else is necessary to secure such rights. The insured shall do nothing after knowledge of a nuclear incident to prejudice such rights.

8. Other insurance

If the insurance afforded by this policy is concurrent with insurance afforded by a like policy issued to the named insured by the Mutual Atomic Energy Liability Underwriters, hereinafter called "concurrent insurance," the companies shall not be liable under this policy for a greater proportion of any loss or expense than the limit of liability stated in the declarations of this policy bears to the sum of such limit and the limit of liability stated in the declarations of such concurrent policy.

If the insured has other valid and collectible insurance (other than such concurrent insurance or insurance under any other nuclear energy liability policy issued by the companies or the Mutual Atomic Energy Liability Underwriters to any person or organization) applicable to loss and expense covered by this policy, the insurance afforded by this policy shall be excess insurance over such other insurance, provided:

(*a*) if there is no such concurrent insurance, the companies shall then be liable for not more than the amount by which (1) the applicable limit of liability of this policy exceeds (2) the sum of the limits of liability stated in the declarations of the policies affording such other insurance;

(*b*) if there is such concurrent insurance, the companies shall then be liable for not more than their proportion, as determined by the first paragraph of this condition, of the amount by which (1) the sum of the applicable limits of liability of this policy and of all such concurrent policies exceeds (2) the sum of the limits of liability stated in the declarations of the policies affording such other insurance.

9. Changes

Notice to any agent or knowledge possessed by any agent or by any other person shall not effect a waiver or a change in any part of this policy or estop the companies from asserting any right under the terms of this policy; nor shall the terms of this policy be waived or changed, except by endorsement issued to form a part of this policy executed by the Nuclear Energy Liability Insurance Association on behalf of the companies.

10. Assignment

Assignment of interest by the named insured shall not bind the companies until their consent is endorsed hereon; if, however, the named insured shall die or be declared bankrupt or insolvent, this policy shall cover such insured's legal representative, receiver or trustee as an insured under this policy, but only with respect to his liability as such, and then only provided written notice of his appointment as legal representative, receiver or trustee is given to the companies within 10 days after such appointment.

11. Cancellation

This policy may be canceled by the named insured by mailing to the companies and the Atomic Energy Commission written notice stating when, not less than 30 days thereafter, such cancellation shall be effective. This policy may be canceled by the companies by mailing to the named insured at the address shown in this policy and to the Atomic Energy Commission written notice stating when, not less than 90 days thereafter, such cancellation shall be effective; provided in the event of nonpayment of premium for or if the operator of the facility, as designated in the declarations, is replaced by another person or organization, this policy may be canceled by the companies by mailing to the named insured at the address shown in this policy and to the Atomic Energy Commission written notice stating when, not less than 30 days thereafter, such cancellation

shall be effective. The mailing of notice as aforesaid shall be sufficient proof of notice. The effective date and hour of cancellation stated in the notice shall become the end of the policy period. Delivery of such written notice either by the named insured or by the companies shall be equivalent to mailing.

Upon termination or cancellation of this policy, other than as of the end of December 31 in any year, the earned premium for the period this policy has been in force since the preceding December 31 shall be computed in accordance with the following provisions:

(*a*) if this policy is terminated, pursuant to condition 3, by reason of the exhaustion of the limit of the companies' liability, all premium theretofore paid or payable shall be fully earned;

(*b*) if the named insured cancels, the earned premium for such period shall be computed in accordance with the customary annual short-rate table and procedure, provided if the named insured cancels after knowledge of a nuclear incident, all premiums theretofore paid or payable shall be fully earned;

(*c*) if the companies cancel, the earned premium for such period shall be computed pro rata.

Premium adjustment, if any, may be made either at the time cancellation is effected or as soon as practicable after cancellation becomes effective, but payment or tender of unearned premium is not a condition of cancellation.

12. Company representation

(*a*) Any notice, sworn statement or proof of loss which may be required by the provisions of this policy may be given to any one of the companies, and such notice, statement or proof of loss so given shall be valid and binding as to all companies.

(*b*) In any action or suit against the companies, service of process may be made on any one of them, and such service shall be deemed valid and binding service on all the companies.

(*c*) The Nuclear Energy Liability Insurance Association is the agent of the companies with respect to all matters pertaining to this insurance. All notices or other communications required by this policy to be given to the companies may be given to such agent, at its office at 60 John Street, New York 38, N. Y., with the same force and effect as if given directly to the companies. Any requests, demands or agreements made by such agent shall be deemed to have been made directly by the companies.

13. Authorization of named insured

The named insured is authorized to act on behalf of all insureds with respect to the giving and receiving of notice of cancellation of this policy, the payment of premiums and receiving of return premiums.

14. Declarations

By acceptance of this policy, the named insured agrees that the statements in the declarations are his agreements and representations, that this policy is issued in reliance upon the truth of such representations and that this policy embodies all agreemens between himself and the companies or any of their agents relating to this insurance.

In witness whereof, each of the subscribing companies has caused this policy to be executed and attested on its behalf by the General Manager of the Nuclear Energy Liability Insurance Association, and countersigned by an authorized representative, but this policy shall be binding upon each company only to the extent of the below-designated proportion of any obligation assumed or expense incurred under this policy.

For the subscribing companies.

By: J. DEWEY DORSETT,
General Manager, Nuclear Energy Liability Insurance Association.

Countersigned_____, 19____, at_____

By_____
Authorized representative

SUBSCRIBING INSURERS

Insurer

Proportion of 100 percent

THE NUCLEAR ENERGY LIABILITY ASSOCIATION,
60 John Street, New York, N. Y.
Nuclear Energy Liability Policy No. _____

DECLARATIONS

Item 1. Named Insured _____
Address _____
No. Street Town or city State

Item 2. Policy Period: Beginning at 12:01 a. m. on the _____ day of _____, 19____, and continuing through the effective date of the cancellation or termination of this policy, standard time at the address of the named insured as stated herein.

Item 3. Description of facility:
Location _____
_____

Type

☐ Production
☐ Utilization

☐ Fuel fabrication
☐ Fuel reprocessing
☐ Power reactor
☐ Critical assembly
☐ Research reactor
☐ Test reactor

☐ Other Description _____
Atomic Energy Commission License No. _____ Effective _____
The operator of the facility is _____

Item 4. The limit of the companies' liability is $_____ subject to all the terms of the policy having reference thereto.

Item 5. Premium $_____. Basic premium, percent _____

Item 6. These declarations and the schedules forming a part hereof give a complete description of the facility, insofar as it relates to nuclear energy hazard, except as noted _____
_____

Representative COLE. I don't want to detain the other witnesses so I will not interrogate Mr. Haugh, but I would like to have him submit a memorandum of his observation with respect to the recommendations of the Commission on the changes in the pending bill.

Mr. HAUGH. To submit that as a memorandum? I would be very happy to, sir.

The CHAIRMAN. I think it would be well for you to comment on the changes as they appear in the new bill.

Mr. HAUGH. Yes, sir. If I get that in within a few days, will that be ample time?

The CHAIRMAN. Yes, sir.

Mr. HAUGH. I will be happy to do that. At that time I will send a copy of the policy and this inspection material that is asked for.

(The information referred to follows:)

S. 715 AND AMENDMENT THERETO RECOMMENDED BY THE ATOMIC ENERGY COMMISSION

The insurance industry recognizes the complexity of the problem which confronts Congress, and I believe that, if necessary, we can accept for the present S. 715 and H. R. 1981 as drafted.

This does not alter the fact that, in our judgment, the bills might be improved and clarified. The modifications suggested by the Atomic Energy Commission answer all of the important questions of which I am aware, and I believe the insurance industry could wholeheartedly accept those modifications.

If I may, I would also like to comment here on a proposal brought out in testimony before your committee, and which is not contained in S. 715, H. R. 1981, or the modifications suggested by the Atomic Energy Commission. I refer to the proposal that the indemnity program should apply on a mandatory basis to all contractors, subcontractors, et cetera of the Atomic Energy Com-

mission itself. I am not questioning the application of the indemnity program. My observations relate rather to the concomitant "financial protection" requirement.

For some parts of the present and future operations of commission contractors, I foresee no problem arising out of the lack of a true insurance market. For other parts I believe such a problem may be very real, and I cite the necessary operations by contractors at Hanford, Wash., and Savannah River, Ga., as two prominent examples.

I urge that if the decision is taken to bring Commission contractors mandatorily under the indemnity program, provision be made to permit the Commission to waive the financial protection requirement where the Commission is satisfied that a domestic insurance market does not exist.

Since the hearing, further consideration has been given the insurance policy for the purpose of meeting the problem of an incident caused solely by some uninsured person. This was exemplified by the hypothetical case of an airplane flying into a reactor. As a result of this further consideration, I am pleased to advise the committee that the policy contract is being revised to include, not only the liability of the reactor operator, designer, supplier of components et cetera, but, also, the liability of any other person, or persons, without regard to whether they may or may not have any responsibility for the operation, construction, or design of the reactor or of any of its parts. As a result of this change, the proposed amendment to subsection 170c for the so-called airplane case and similar cases, will not be required as the revised nuclear energy liability contract would take care of such cases.

While the Atomic Energy Commission proposes to disregard "type" in determining the amount of financial protection as provided under section 170b, we do believe that, for rating purposes, type of reactor must be taken into consideration. It is quite possible that the Atomic Energy Commission, in determining the amount of financial responsibility to be established by the licensee, has in mind, not the relative hazards of individual reactors, but rather the potential damage which might be caused by a reactor of a given power. Admittedly, two reactors of the same power, but of different types, might have different problems of causing a loss of catastrophic proportions, but in the event such a catastrophe did occur with either, it might well be that the potential damage would be substantially the same for one as for the other.

It is our considered opinion that type of reactor has a definite bearing upon the hazard, and for that reason, we believe it important that it be taken into consideration in determining premium charges.

It was suggested that I indicate, too, the extent and reasons for "any inconsistency with the reasons in your position of last year with respect to these amendments, if there is any." While some of the amendments currently under consideration were not proposed last year, it is a fact that since that time much careful thought and study has been given the entire subject, and it is to be expected that as a result of that there would be proposed at this time amendments designed to cover situations which might not have been as thoroughly thought through a year ago.

I believe the only inconsistency, if it can be termed that, between our position now and that of a year ago has to do with the amount of financial protection to be established by licensees. A year ago we urged that all licensees with the exception of educational and eleemosynary institutions operating research reactors be required to furnish financial protection in an amount equal to the amount of liability insurance available. While I believe a good case can continue to be made for this decision, it does not appear to be practicable and, for that reason, we have receded from that stand.

Senator ANDERSON. Is he covering the questions as to why some of these changes are proposed? Have you covered that already? Do you believe that there should be a provision as the AEC has suggested providing that in case of an accident caused by an airplane, for example, that the Government would be the only party liable and the insurance companies would be removed from liability?

Mr. HAUGH. We did not cover that. That was in line with the views to be submitted.

The CHAIRMAN. I asked him to submit a statement on each change in the new bill. It was quite lengthy and I did not know whether we could cover it all this morning.

Senator ANDERSON. Don't you think we will have to have a chance to reexamine some people and ask them some questions on what they suggest, because if we are to exclude from liability of the private companies anything that could be clearly proved to be the negligence of the operating company, we will successfully have transferred to the Government the entire liability or nearly the entire liability.

Mr. HAUGH. May I answer that, Senator Anderson?

Senator ANDERSON. Yes. You heard the questions I directed yesterday.

Mr. HAUGH. I was here yesterday and I heard that. May I say this. It is not that we are proposing that the Government do this, that, or the other thing. Rather it is this sort of thing. I think it should be pointed out what we are talking to is the liability insurance contract.

The utilities and other power reactors—potential reactor operators—indicated, I think quite properly, that if they were to embark upon the construction and operation of reactors with their potential catastrophe hazard of unknown size, that they wanted some assurance of greater protection to cover their liability than was normally available. As a result of that, as I understand it, we have set about and established special insurance facilities to take care of that, and there has been this discussion of the Government indemnity over and above that to provide even greater capacity.

The illustration that was used, sir, was the case of a plane dropping into a reactor and causing it to burst its containment, and cause widespread damage.

Senator ANDERSON. That is right. That is the one we discussed.

Mr. HAUGH. Yes. As to whether the reactor operator and/or anybody else connected with the reactor was or was not liable in that instance is contingent in part upon the extent to which the theory of absolute liability may apply. Actually what has happened is that the contract covers the liability of the owner and operator of the reactor and anyone else that has supplied any parts, has anything to do with the operation, the construction of the reactor, its design, anything of that sort. If it were determined by the courts in this hypothetical case that was cited that there was no liability on the part of the reactor operator or of anybody connected with the design, construction, the maintenance, the operation of the reactor, then under those conditions there would be no liability on the operator, the owner, or a single soul, and that is what the liability policy was designed to cover. The liability of anybody that is connected with the reactor.

Senator ANDERSON. Then you agree with me that the way the insurances companies had asked the AEC to change it and the AEC had changed it would have relieved the insurance companies of any liability in the case of an airplane dropping on a reactor?

Mr. HAUGH. No, sir, I did not, and they did not ask for it for that reason. I want to point this out. It was very properly pointed out, and we feel that things should be pointed out in advance to avoid any potential understanding as to what liability insurance is and what

it does. Liability insurance, whether it be on these reactors, on an automobile, a compensation policy or anything else, covers the full legal liability of the people that are insured. In this reactor, the people that are insured are large in number in addition to the named insured. I am sure you realize it is all these other people that have anything to do with the construction of it. If there was an incident where the courts said none of those people is liable—none of them——

Senator ANDERSON. Then the Government is liable.

Mr. HAUGH. May I go further? I feel we should call to your attention the fact, it may be improbable, it may appear to be impossible, but there could be such a situation, and you should have been acqainted with it in advance. I say this: If the theory of the indemnity legislation is that people should be paid even if there is no liability on any of those people, then under those conditions, if that is the objective sought to be accomplished, the bill as now drafted does not do it and should be amended properly. We are not asking that you do that, sir. But we do feel in all fairness to you, it should be brought to your attention and you should know of it before the legislation is enacted. It is for that reason that we brought it out.

Senator ANDERSON. Can we get agreement from you that the purpose of the amendment was to make adequately sure the Government would be liable under those circumstances?

Mr. HAUGH. As I understand the amendment as proposed, it would do just that. Yes, sir, the Government would be liable under those circumstances as I understand that amendment.

Senator ANDERSON. Didn't you suggest the amendment?

Mr. HAUGH. We suggested that if that is the objective of the legislation—to take care of the public even though there is no liability on the part of anyone connected with the reactor—then that is the way to do it.

Senator ANDERSON. The other day there was a little story about a mouse crawling into a switch, and disrupting the whole system. Would that mean that each time there is an accident, the insurance companies would be looking for the mouse or pigeon that cause the reactor to explode and thereby made the Government solely liable?

Mr. HAUGH. No, sir, that is not the case in the general liability contracts written today, covering all sorts of liabilities, whether it be other utilities or not.

Senator ANDERSON. You don't know of one other policy, do you, where the Government is the whole indemnitor?

Mr. HAUGH. No.

Senator ANDERSON. Why would you bring this out? Of course, this is not the accepted practice. This is wholly new.

Mr. HAUGH. That is right. We are setting out to cover 100 percent the liability of all these people. We have stretched to make certain that all of the product manufacturers, supplies, all of the people that had anything to do with that reactor, their liability is covered.

Senator ANDERSON. I picked up a paper by Edward I. Farley of Marsh-McClennan, whom you and I would recognize as large and reputable insurance brokers, dealing with insurance of nuclear reactors. I read from it:

The $50 million per installation offered by the insurance industry to cover third party liability risks does not satisfy the amount of public liability protection desired by industry to meet possible damages and to justify risking stockholders' assets in the nuclear field. Therefore, to encourage the development of the atomic energy industry and to provide additional protection for the public, Congress is expected to make available up to $500 million indemnity above a stipulated amount of this private insurance. When this Federal indemnity becomes available, the total amount of financial protection should be adequate to remove concern.

(For full text of Mr. Farley's remarks, see p. 237.)

If you read that, you would conclude that the only thing that was desired was some additional coverage above the $50 million, but under the provision that you have suggested, and that the AEC recommends, the $500 million would become available without the private insurance companies picking up a nickel of the check.

Mr. HAUGH. Under those unique circumstances they would.

Senator ANDERSON. Don't you look toward unique circumstances? How many times have two airplanes flown together in broad daylight over the Grand Canyon?

Mr. HAUGH. And collided—once. I agree with you.

Representative COLE. What is the reason that your policy can't cover that situation without raising the rates?

Mr. HAUGH. It is a liability contract. The sole purpose of the contract is to say to the purchaser, plus all of his contractors and so forth, your liability is covered for so much money. If he has no liability, he says he doesn't need the coverage.

Representative COLE. It could be made to cover that situation, could it not; that is, your policy?

Mr. HAUGH. If the law said that he was liable for anything that happened, it would be automatic. I am not proposing that, you understand. Offhand, I would envision a great deal of difficulty how to phrase a policy that says, in addition to covering liability, it covers any other claim that may be brought.

Senator ANDERSON. You demonstrated it by the language you suggested be inserted in the act. You automatically transfer to the Government all this indemnity.

Mr. HAUGH. From a catastrophe.

Senator ANDERSON. Do you think that is desirable?

Mr. HAUGH. I answer you, sir, in this way. In my own opinion only—not being a lawyer I suppose I should not express a view on it, but I shall.

Senator ANDERSON. I am not a lawyer either. I am in the insurance business, and I am trying to find out.

Mr. HAUGH. I would rather expect that it is quite probable that the mere existence of an unusual hazardous operation, such as the operation of a reactor, in all probability might be construed by the courts as in itself establishing liability on the part of the person that set it there, on the theory of absolute liability. Mr. Murphy discussed that in his report. It is not a settled fact, however, in all instances. The courts have held some varying views on this question of absolute liability. From our point of view, that particular proposal with respect to this amendment illustrated by the airplane crashing is for the purpose of calling attention now to the fact that if the purpose of the governmental indemnity, excess of insurance, is to

afford additional protection to the operators of reactors for their liability, then you don't need that. If the purpose of it is to make certain that under all conditions, even when there may not be liability on the part of the owner and operator of the reactor, that members of the public will be paid for any damage—even if there is no liability—then you do need it. That is what the difference is.

Senator ANDERSON. You tried to illustrate by showing how universal the practice was and you mentioned workmen's compensation.

Mr. HAUGH. Yes.

Senator ANDERSON. Suppose a workman is injured due to his own negligence, does he draw compensation?

Mr. HAUGH. Yes.

Senator ANDERSON. But the employer has no liability.

Mr. HAUGH. He has a definite liability under the Workmen's Compensation Act. That is the reason. It is a statutory liability imposed on the employer.

Senator ANDERSON. Exactly. You do change the circumstances and don't make it solely liability.

Mr. HAUGH. You are wrong. What I said was that the compensation policy definitely says it covers the employer's liability under the Workmen's Compensation Act. It covers exactly that, sir. It covers his full liability, included under the Compensation Act, and that is an act especially designed to take care of injured workmen. It sets out the conditions under which he is liable and the extent to which the liability shall be measured. You and all of us issuing compensation policies cover that every day. It is a statutory liability of the employer.

Senator ANDERSON. But it is added to the things that might arise out of negligence for which the employer might not be liable.

Mr. HAUGH. Yes, but it is liability.

Senator ANDERSON. In this particular instance, if the airplane drops, it is not the negligence of the operator of that reactor.

Mr. HAUGH. That is right.

Senator ANDERSON. So if you want to make it comparable you do as you do in workmen's compensation and make them liable as well to the general public, regardless of whether they were actually legally liable for it. That is what you object to; is that not correct?

Mr. HAUGH. No; I am not objecting. What I am trying to do is to call attention to a situation that exists so as to avoid any subsequent misunderstanding. It is a case of calling your attention to the fact that if the court should say he is not liable, then all that is not covered under the bill as drafted or under the policy.

Senator ANDERSON. Let me ask it this way: As the bill was originally drawn you would have some difficulty sustaining the fact that the insurance company might not be liable in case of a accidental explosion?

Mr. HAUGH. No, sir. It would be the same with or without this amendment.

Senator ANDERSON. So the sole purpose of the amendment was to make the Government legally liable in case you could not find anybody else who was liable.

Mr. HAUGH. No, sir.

Senator ANDERSON. What was it, then? I thought you just got through saying it was.

Mr. HAUGH. No, sir.

Senator ANDERSON. If the court said nobody was liable, and it was the desire of the Congress to find somebody liable, then you said this made the Government liable.

Mr. HAUGH. The amendment as I understand it, as drafted——

Senator ANDERSON. You must understand it, because you submitted it.

Mr. HAUGH. I did not, but it was proposed.

Senator ANDERSON. So they must have understood what they were submitting.

Mr. HAUGH. That is right.

Senator ANDERSON. All right.

Mr. HAUGH. It is simply this: If it is the desire to make certain that the public will be compensated for damage in the event it is determined that there is no liability at all on the part of the reactor operator and owner or anyone connected with it—no liability—if it is still determined that there should be compensation, then the way to accomplish it would be in the way suggested there.

But it was no effort on the part of insurance companies to relieve themselves of a nickel's worth of liability. That is what I want to make certain here. It is most unfortunate that impression crept in. It was due solely to calling attention to the situation in the event that there is no liability on the part of the operator reactor—if there is, that proposed amendment would not come into play. If the reactor operator or anyone connected with it has any liability, that proposed amendment would not come into play at all.

It is of value only if you desire—that is, you gentlemen in enacting legislation—if you desire to make a provision that, even if there is no liability on anybody's part, if somebody is injured you want to pay them. That is an entirely different thing than a liability provision.

Representative COLE. I still do not understand why your policy could not be written so as to cover that situation, of protecting the public for damage which flows from this reactor, irrespective of whether the owner or his subsidiaries are legally liable or not. Why can't a policy be written to cover that? I do not see where it would add 1 cent to our premium cost.

Mr. HAUGH. I am not trying to quibble or anything of that sort in that connection—and this may seem to you an extreme illustration, as is the case we are citing extreme—on that basis if you said anyone is injured, let me be very extreme and assume the case of an individual who is told, don't go into that building, there are signs to prohibit him from going in, the watchmen and everybody tells him to stay out, but he sneaks in and gets himself injured. Everybody told him to stay out and he is injured. You feel he should be paid anyway?

Representative COLE. You are being absurd.

Mr. HAUGH. No.

Representaive COLE. That would be excluded in your policy. Any injury that is incurred by reason of the overt deliberate willful act of the claimant would be rejected. Think of something else.

Mr. HAUGH. It is to illustrate the problem the drafters get into when they try to say you are going to cover beyond the liability. The term "legally liable" permits the court to decide. If he is not liable, we don't pay. If he is liable, we pay. In most cases you can

determine there is legal liability. In the case of injury, there are going to be, I suspect, sir, alleged injuries. Some of them might turn out to be actual injuries in which there is going to be, to put mildly, extreme difficulty in relating the injury to a reactor. Unless we are extremely careful in the phraseology you might discover that it was so broad you are paying all the claims. He has an injury from exposure to radiation, if you will. He may have gotten it from an X-ray or elsewhere; we do not intend to cover that.

I am not a policy drafter, but I know the problems these people get into in trying to draft phraseology so that what all of us agree what we intend turns out to be interpreted will be what all of us intended when it comes to an argument as to the merits or demerits of a particular claim.

I repeat that this illustration, or this proposal that was mentioned here for a possibility of taking care of an incident where there was no liability, I admit is possible. It is improbable. It is possible. We are not arguing that you do that sort of thing. We think it is something that should have been brought out and brought to your attention and then the answer to it, it seems to me, should be which we are trying to do.

Are we trying to determine that we should make provision for the legal liability of these people who are seeking licenses to operate and construct reactors, or are we going beyond that and seeking to compensate people where there is no liability on the part of any of them?

Representative COLE. Does that policy specifically exclude sabotage?

Mr. HAUGH. I do not recall that it does. It does not is what I am informed.

Senator ANDERSON. I think we might all recognize as a practical matter that if there was a claim that was going to run up to $50 million that the first responsibility of the insurance companies, if this amendment is passed, is to try to make sure that the jury finds there is no liability on the part of the reactor company so the $50 million is paid by the Federal Government.

We have all gone through litigation before and it is the first responsibility to find somebody to whom you can subrogate that claim. This looks wide open to that sort of operation.

Mr. HAUGH. I can assure you that there was no such thought of any shape or manner connected with that question.

Senator ANDERSON. The Commission recommended that we do not recognize differences in types of facilities. I notice in the Marsh-McClellan paper on page 4:

> The following factors will be taken into account with a system of rates for each. The first item is type of reactor.

So the insurance companies apparently are going to work at cross purposes to what the Atomic Energy Commission recommended.

Mr. HAUGH. We are taking type of reactor into consideration in rating; yes, sir.

Senator ANDERSON. Then you do not agree with the recommendation?

Mr. HAUGH. I think theirs had to do with the determination of something other than rates. I forgot the particular section.

Senator ANDERSON. It reads this way:

With regard to type of facility we believe since all types of reactors are required through the license system to be so designed as to assure safe operation—

and so forth—

it is not consistent to apply quantity valuation as to various types.

Mr. HAUGH. That was the amount of insurance. For them to determine how much insurance they needed. I believe that did not in any way relate to presupposing that we would not consider type in determining hazard.

Representative COLE. If type is an important element in determining the rate why is it not equally important in determining the amount?

Senator ANDERSON. That is exactly right.

Mr. HAUGH. We take type into consideration.

Representative COLE. You will put that in the memorandum you will send us?

Mr. HAUGH. Yes, sir.

Representative COLE. Will you also indicate why any inconsistency with the reasons in your position of last year with respect to these amendments, if there is any?

Mr. HAUGH. Yes, sir.

Representative COLE. On the question of sabotage my attention is called to the fact that your policy does exclude sabotage. Not by the express words sabotage—

This policy does not apply, (e) to bodily injury or property damage due to war, whether or not declared, civil war, insurrection, rebellion, or revolution, or to any act or condition incident to any of the foregoing.

That is what sabotage is. An undeclared war or revolution, and so forth.

Mr. HAUGH. Frankly, Mr. Cole, that interpretation would not hold.

Representative COLE. It would not?

Mr. HAUGH. In the first place a loss is attributed to sabotage. In the first place it is a difficult thing to prove. In the second place if you do prove that it is a sabotage and an individual actually performed the act that sustained this loss you still have not connected him with an act of war. You have not connected him with deliberately acting on the instruction of a foreign government. I think it just would not holdup.

Senator ANDERSON. Could I ask a final question. I will get off this question of liability because neither one of us is going to be persuaded on it.

I introduced a bill, S. 1684, which had to do with amending the act on the Reactor Safeguards Committee and providing accessibility to these reports for the insurance companies. If you do not wish to do so now would you at a subsequent time comment on the necessity of making these reports available to you? Maybe not the internal documents, but certainly the essence of all these reports.

Mr. HAUGH. May I say this, Senator, I think Mr. Price raised a similar question. May I answer it briefly in this way:

We feel that there should be available to us from our insured—the reactor operator or the person seeking the insurance—all the information that is available to him pertaining to the reactor hazards. We ask for access to the hazards evaluation report, the site survey, the

engineering reports which will give us details on the reactors, its structure and containment, and anything else pertaining to the hazards. We would like to have available to us all the information that the Atomic Energy Commission has that affects the hazard of that particular installation.

We have no disagreement with not having access to any records which do not pertain to the hazard and which may be deemed to be confidential within their organization. That is of no concern to us so long as we can have all the information that is available pertaining to the hazards of the particular risk.

The CHAIRMAN. Thank you.

Senator ANDERSON. May I finally say, do the schedule rates substantially favor the large utility operator as against the smaller one who might want to set up a small plant?

Mr. HAUGH. Let me say this. They are not set up or designed to favor large or small.

Senator ANDERSON. I did not use the word "designed".

Mr. HAUGH. I understand.

Senator ANDERSON. Do they favor?

Mr. HAUGH. In this term, yes. I used several illustrations and I undertook to endeavor to express those premiums in terms of mills per kilowatt hour. In these illustrations they ranged—this was for the provisional premium without considering any retroactive return on the adjustment basis—on the basis of 60 percent operating capacity they range from 26/100 of 1 mill for the first case I cited, which was the largest reactor, to a small reactor which came out six-tenths of a mill. Those were the figures I believe I put in the record.

Representative COLE. On the kilowatt basis the rate favors the small one.

Mr. HAUGH. No. It does not favor him. It is a little over twice what it is on the very large one. It is about three times on what it is on one in a sparsely populated area and was a large capacity reactor.

I would expect, Senator, and I do not know too much about utilities or anything else, that in the generation of power by and large that other things being equal a large plant can generate electricity for somewhat less than a small plant. I would expect that to be true. It is true in a great many things where you have quantity production. It can work out less. Their actual premium is larger. But because they can generate relatively more current it gets their kilowatt hour cost down on the large one.

Senator ANDERSON. I have not read your paper, but reading the Marsh-McClellan paper they came out with about the same .65 mills per kilowatt-hour with an accuracy factor of plus or minus 50 percent.

Mr. HAUGH. Yes.

Senator ANDERSON. The rates you have given here on the boiling water type mean that it would cost $120,000 for the first five million and $130,000 for the next 45 million, is that correct?

Mr. HAUGH. That is illustration number 1. I should not have spread so many papers in front of me. I think there is $10,000 missing myself.

Senator ANDERSON. $120,000 for the first 5 million and $130,000 for the next 45 million.

Mr. HAUGH. That is not right.

Senator ANDERSON. So the operator of a small plant such as a cooperative in Nebraska, even though the Commission decided that because of its relative scarcity of population around it and the small amount of property damaged by it, is only required to pay for $5 million, they would be paying half as much as the one located in New York City that involved $50 million coverage.

Mr. HAUGH. No. The one in New York City would pay more than we looked at here. This was not in New York City. That was located in a high value agricultural area. The one in New York City would pay more than that, sir.

Senator ANDERSON. I see. This one is 50 miles from Chicago. That is an agricultural area, is it not?

Mr. HAUGH. Yes.

Senator ANDERSON. That is the Dresden plant, is it not?

Mr. HAUGH. Yes, that is right.

Senator ANDERSON. I will skip the New York illustration and say that a reactor out in Nebraska located in a very isolated area with no large property values within 200 miles of it in any direction would pay half as much for $5 million coverage as the Dresden plant with all the great values near Chicago would pay for $50 million coverage.

Mr. HAUGH. I do not know about the 200 miles. I have not done it on that basis. This third one was an attempt to approximate the Elk River which was in Minnesota.

Senator ANDERSON. It might end up 179 miles or 182 miles but roughly some figure like that.

Mr. HAUGH. I will say to you, sir, using the first illustration for the same amount of insurance, the first came out for a million dollars of insurance at $40,000 and the other came out $7,380. I do not think those are unreasonable differences at all, sir. I am talking to the first million. When you add the next 4 million to it, the Dresden one you referred to, the other one the small reactor—are you talking to the ones I used—came out $14,720; the Elk River one.

Senator ANDERSON. I merely said if the Atomic Energy Commission decided that this cooperatively owned reactor out in Nebraska, located as it will be away from high property values so you do not have the property damage to worry about that you do with high values close at hand, located away from centers of population, so you do not have the individuals to worry about, if they require that only $5 million of insurance is required on that but require $50 million of insurance on the Dresden plant 40 miles from Chicago, the cooperative in Nebraska would pay half as much for its $5 million as Commonwealth Edison would pay for its $50 million. Is that correct?

Mr. HAUGH. I do not think that is quite right, sir.

Senator ANDERSON. Suppose you send us a memorandum showing it is not right.

Mr. HAUGH. Yes.

(The information referred to follows:)

COMPARISON OF ELK RIVER AND COMMONWEALTH EDISON PREMIUMS

On page 144 of the testimony, Senator Anderson asked that I submit a memorandum indicating whether or not he was correct in his assumption that the Elk River project, if required to purchase only $5 million of liability insurance, would pay half as much for that amount of insurance as Commonwealth would pay for $50 million of insurance. I indicated that that was not right and agreed to submit a memorandum.

The figures appearing in my prepared statement and made part of the record show for illustration No. 1, which is the Commonwealth Edison project, a premium of $250,000 for $50 million of insurance. That same statement shows for illustration No. 3, which is the Elk River project, a premium of $22,080 for $5 million of insurance. This latter figure is not half of the amount which would be charged Commonwealth Edison, but is slightly less than 9 percent of that amount.

Mr. HAUGH. I would like to point this out to you. We are talking about different amounts. I am not arguing the merits or what the amount should be for a particular one. Because there was interest in this small reactor that I say is the equivalent of the No. 3 illustration, in working out the cost per kilowatt-hour, I did not check it on the $5 million that you referred to, but I did on $10 million. The cost per kilowatt-hour would be almost the same as it is for the Chicago one, 25 one-hundredths of 1 mill, assuming 60-percent output, which is just about what you would say is equivalent in cost measured in terms of electrical output. The Chicago one required to buy $50 million and that one required to buy $10 million. It seems to me that illustrates the legitimacy of the thing.

Representative PRICE. Mr. Haugh, I notice in the information that you have furnished to the committee on the quotation of insurance for reactors, you furnished us with quotations on five reactors.

Mr. HAUGH. Yes, sir.

Representative PRICE. Have you furnished quotations on any other reactor projects?

Mr. HAUGH. Let me think which were in the five. I know they are working on two this week while I am down here. I don't know if they have finished.

Representative PRICE. Have you submitted a quotation on the PRDC reactor?

Mr. HAUGH. No. That has not been submitted, and we have not furnished that. The Vallecitos is in there. The Commonwealth Edison is in there.

Representative PRICE. It would seem to me that having broken ground last August, the assumption being that they are further along than many others in their work, and that would be the earliest one seeking a quotation. Is there any reason why a quotation has not been furnished up to this point?

Mr. HAUGH. Only, this, sir. We do have to first get someone to say, "I want insurance," and "How much is it going to cost me?" and you have access to this, that, and the other before we can move.

Representative PRICE. They have never asked you?

Mr. HAUGH. We have not to my knowledge—and I think I would know of it if we had—we have not been asked at this point to make a quotation on that reactor.

Representative PRICE. You say there are two others that you think were asked?

Mr. HAUGH. There were a couple of small ones. I am sorry I cannot remember the names. There is a research reactor. As to whether the one at MIT has actually been submitted for rating, I don't know; it might very well have. That is a research reactor.

Representative PRICE. I assume you are thinking more in terms of power reactors than research.

Mr. HAUGH. Yes.

Representative PRICE. I wonder if you would mind bringing this up to date before we conclude the hearing on this matter?

Mr. HAUGH. Certainly. The hearings are continuing tomorrow?

Representative PRICE. Yes.

Mr. HAUGH. I will find out by phone tonight what the status is at the end of today, and can hand you gentlemen the information on the status of that if you wish.

(Mr. Haugh subsequently informed the Joint Committee by letter dated April 1, 1957, that "no additional power reactors had been rated by the Committee. The reactors they were undertaking to rate at that time were research reactors."—Ed.)

The CHAIRMAN. Thank you very much, Mr. Haugh. We have kept you for 2 hours, now.

(NOTE.—Pertinent correspondence regarding proposed rates for nuclear reactors to be charged by the Nuclear Energy Liability Insurance Association, follows, together with correspondence from Mr. Haugh regarding S. 1684 and the proposed extension agreement to the nuclear liability insurance policy:)

NUCLEAR ENERGY LIABILITY INSURANCE ASSOCIATION,
New York, N. Y., February 21, 1957.

Mr. JAMES T. RAMEY,
Executive Director, Joint Committee on Atomic Energy,
The Capitol, Washington, D. C.

DEAR MR. RAMEY: Please refer to your letter to Charles J. Haugh, vice president of the Travelers, concerning the specific rates which have been tentatively quoted on reactors.

These rates are established for our members by the National Bureau of Casualty Underwriters, a licensed rating organization under the various State regulatory laws, in accordance with a rating rule now in effect under those laws. Rates for members of the Mutual Atomic Energy Reinsurance Pool are similarly established by the Mutual Insurance Rating Bureau, which has been cooperating with the national bureau in the establishment of proper rates for these new hazards.

I enclose herewith copies of letters sent to us by the national bureau with respect to the three risks for which we requested that rates be established by the bureau in accordance with their filed rating rule.

In addition to these three risks, it is our understanding that, upon the request of the Mutual Atomic Energy Reinsurance Pool, two other specific rates have been promulgated by the Mutual Insurance Rating Bureau. It is our further understanding that these are as follows:

Yankee Atomic Electric Co.—Location of reactor, Rowe, Mass.

Amount of insurance:	*Annual premium*
First $1,000,000	$20,000
Next $4,000,000	[1] 10,000
Next $5,000,000	[1] 4,000
Next $10,000,000	[1] 2,000
Next $20,000,000	[1] 1,000
Next $10,000,000	[1] 1,000

[1] For each million dollars of insurance.

Armour Research Foundation—Location of reactor, Chicago, Ill.

Amount of insurance:	*Annual premium*
First $1,000,000	$12,000
Next $4,000,000	[1] 4,000
Next $5,000,000	[1] 1,600
Next $10,000,000	[1] 800
Next $20,000,000	[1] 500
Next $10,000,000	[1] 500

[1] For each million dollars of insurance.

The foregoing ratings contemplate coverage for any "hot" laboratory operated at the site of the reactor. The rating developed for Battelle Memorial Institute contemplates coverage also for a critical facility at the same location as the reactor.

I trust that this gives you the information you desire. Please be assured of our continuing desire to cooperate with the Joint Committee on Atomic Energy in all respects.

Very truly yours,

J. DEWEY DORSETT, *General Manager.*

NATIONAL BUREAU OF CASUALTY UNDERWRITERS,
New York, N. Y., February 18, 1957.

Mr. J. DEWEY DORSETT,
General Manager, Nuclear Energy Liability Insurance Association,
New York, N. Y.

DEAR MR. DORSETT: On the basis of the information currently available to us, we are approving the following tentative annual provisional premium charges for nuclear energy liability insurance for the nuclear reactor, including any incidental "hot" laboratories, operated by the Commonwealth Edison Co., et al., in Grundy County, Ill., Battelle Memorial Institute, in West Jefferson, Ohio, and General Electric Co., in Vallecitos, Calif.:

Commonwealth Edison Co., et al.—Location, Grundy County, Ill.

Amount of insurance:	*Annual premium*
First $1,000,000	$40,000
Next $4,000,000	[1] 20,000
Next $5,000,000	[1] 8,000
Next $10,000,000	[1] 4,000
Next $20,000,000	[1] 2,000
Next $10,000,000	[1] 1,000

[1] For each million dollars of insurance.

Battelle Memorial Institute, Columbus, Ohio—Location, West Jefferson, Ohio

Amount of insurance:	*Annual premium*
First $1,000,000	$6,250
Next $4,000,000	[1] 2,250
Next $5,000,000	[1] 1,050
Next $10,000,000	[1] 750
Next $20,000,000	[1] 750
Next $10,000,000	[1] 750

[1] For each million dollars of insurance.

General Electric Co.—Location, Vallecitos, Calif., near Livermore, Calif.

Amount of insurance:	*Annual premium*
1st $1,000,000	$6,000
Next $4,000,000	[1] 3,000
Next $5,000,000	[1] 1,200
Next $10,000,000	[1] 1,000
Next $20,000,000	[1] 1,000
Next $10,000,000	[1] 1,000

[1] For each million dollars of insurance.

These premium charges are to be adjusted on a pro rata basis for the period from the effective date of the coverage to January 1, 1958. For coverage beyond January 1, 1958, it will be necessary to resubmit these risks to the national bureau for approval of the appropriate provisional premium charges.

We wish to emphasize that the foregoing quotation is completely tentative, being based on information previously submitted to us. The final provisional premium charges to apply up to January 1, 1958, will be determined upon submission of additional information subsequent to a complete inspection of these facilities.

The provisional premiums applicable to these risks will be subject to any adjustment developed in accordance with the terms of the long-term industrywide rating plan providing for a retroactive downward adjustment of rates in the event substantial losses do not emerge over a period of time and surpluses develop.

Yours very truly,

NUCLEAR ENERGY LIABILITY DIVISION.
R. H. ELLIOTT, *Manager.*

Insurance rates on reactors

[Composite table]

	Amount	Electric kilowatts	Thermal kilowatts
Yankee Atomic Electric Co	$130,000	134,000	480,000
Armour Research Foundation	59,000	0	50
General Electric Co. (Vallecitos, Calif.)	67,000	3,000	12,000
Commonwealth Edison	250,000	180,000	630,000
Battelle Memorial Institute	50,500	0	1,000
Elk River	69,430	22,000	58,000

These figures were determined by the following rates per million of insurance:

Company	1st million	Next 4 million	Next 5 million	Next 10 million	Next 20 million	Next 10 million
Yankee	$20,000	$10,000	$4,000	$2,000	$1,000	$1,000
Armour	12,000	4,000	1,600	800	500	500
General Electric	9,060	3,000	1,200	1,000	1,000	1,000
Commonwealth	40,000	20,000	8,000	4,000	2,000	1,000
Battelle	6,250	2,250	1,050	7,750	750	750
Elk River	7,360	3,680	1,470	1,000	1,000	1,000

THE TRAVELERS INSURANCE CO.

APRIL 8, 1957.

Mr. JAMES T. RAMEY,
Executive Director, Joint Committee on Atomic Energy,
The Capitol, Washington 25, D. C.

DEAR MR. RAMEY: Unfortunately, your letter of March 22 did not reach me until after I had returned from the March 25–27 hearings.

I am of the firm opinion that the Reactor Safeguards Committee performed an extremely useful function. This is not merely my own opinion, but that of all of my associates on the governing and rating committees of the Nuclear Energy Liability Insurance Association.

I believe, in fact I urge strongly, that such a committee should continue in existence. Certainly, S. 1684 would insure the continuation of such a committee.

Sincerely,

CHARLES J. HAUGH, *Vice President.*

THE TRAVELERS INSURANCE CO.,
April 9, 1957.

Mr. GEORGE NORRIS, Jr.,
Counsel, Joint Committee on Atomic Energy,
The Capitol, Washington, D. C.

DEAR MR. NORRIS: Mr. Haugh has gone out of town for 10 days and he left me a note to the effect that he had promised to furnish you with a description of what we have been calling the "iffy" policy, to be issued by the stock and mutual liability pools against nuclear energy hazards. I am describing the intended coverage below in general terms, and if any part of this letter is inadequate for your purpose I will appreciate your letting me know.

Neither the forms nor the rating system for this coverage are complete, but as we see it now, it will not be a separate complete policy, but rather it will

be the facility policy which you have, modified by what will probably be called a "special coverage endorsement."

In the typical situation an operator of a private reactor will buy a reactor policy which, as you know, gives coverage not only to him but to all other connected interests such as designers, constructors, or suppliers of the reactor. Actually, as a result of the discussions at the recent hearings, we are working on a redraft of the reactor policy to bring in all interests who may be liable. The now classic example of this latter type of interest is the owner of the airplane which by chance crashes on the reactor, precipitating an incident.

Quite early in the discussions of nuclear energy liability coverage with our present customers who find themselves in the position of designer, builder, supplier, etc., we encountered a line of reasoning which runs something like this: You insurance companies say that you are going to sell insurance to the reactor operator and that the policy you issue to him will also insure me and all other interests in a similar position to mine. That is fine, but what assurance do I have that the reactor operator will purchase limits which I consider adequate or that he will be sure to maintain the insurance in force?

It is clear enough that no such assurances can be given. We therefore agreed to the principle that we would make available a single-interest policy to the supplier type of interest under which he could purchase whatever limits he liked covering him only, up to the capacity of the syndicates.

The name "Iffy" got tied to this type of coverage because it will definitely provide that a supplier buying such a policy will have available to him not the total limit on the face of his policy, but rather that limit minus the limit purchased by the reactor operator. There will be a further provision to the effect that the total liability on all policies covering a particular reactor will not exceed the maximum capacity of the syndicates.

At the present time, in the absence of enacted indemnity legislation, and when some operators of small reactors appear to be thinking in terms of relatively low insurance limits, there is real interest in "Iffy" coverage. It is possible that when indemnity legislation is enacted this interest will disappear entirely. However, I could not guarantee even in the presence of indemnity legislation that there will not be some who will still want to make assurance doubly sure.

Sincerely,

R. H. BUTLER, *Secretary.*

The CHAIRMAN. The next witness is Mr. Hubert W. Yount, vice president, Liberty Mutual Insurance Co.

STATEMENT OF HUBERT W. YOUNT, MUTUAL ATOMIC ENERGY REINSURANCE POOL AND THE AMERICAN MUTUAL INSURANCE ALLIANCE

Mr. YOUNT. Mr. Chairman, gentlemen, my name is H. W. Yount. I am vice president of the Liberty Mutual Insurance Co., and of the Liberty Mutual Fire Insurance Co. I am appearing here today at the invitation of the committee, representing the members of the Mutual Atomic Energy Reinsurance Pool and the American Mutual Insurance Alliance, which sponsored the original organization of that pool.

In the invitation which the committee extended, they asked me to discuss three particular points. The first had to do with indemnity legislation.

A year ago, when I had the privilege of appearing before the committee, we took a neutral position on the need for such legislation, raising no objection, and pointing out certain things that probably should be considered if legislation was to be drafted. We submitted several proposed amendments to the legislation last year.

After working with our customers for a year, I think we are pretty well convinced that in the public interest and to further the program of the peaceful development of atomic energy, some such legislation is necessary. Whether the hazards involved are actually so great as

people fear or not seems immaterial. The fact is that our customers, the manufacturers of equipment for atomic industry, are vitally interested and desire such legislation.

Furthermore, we believe that if the indemnity principle is acceptable it should apply equally to all types of hazards, whether licensed private operations in accordance with the provisions of the 1954 act or whether under Government operation or financed by the Government under private contract arrangements. The reason for this position is that we believe the manufacturers of component parts and supplies should be in the same position with respect to protection regardless of whether they are selling to Government or private industry. At the present time we believe that with respect to Government operations the contractor performing the operation is held harmless but the supplier of parts can still be held liable under products liability for all of the damage that might result in the event of a nuclear failure at a Government installation. We believe the basic protection to such suppliers should be the same in all circumstances, including Government indemnity.

Our views last year favored the Anderson bill, which has been introduced this year as S. 715. I had the privilege yesterday of reviewing for the first time the amendments proposed by the Commission.

In order to understand our views with respect to those amendments, it must be kept in mind that we have regarded this problem as one requiring very close collaboration and cooperation among all parties at interest. Our liability insurance coverage, for instance, should track as far as possible the coverage that is to be given by a Federal bill, or vice versa. As a matter of fact, in drafting our coverage this year, we followed as closely as we could the original provisions of the Anderson bill with respect to who was to be covered and what was to be covered and what kind of an incident was to be covered, and so on. That has been one of our problems in drafting coverage.

The amendments which the Commission has proposed appear satisfactory to our group in order to accomplish these objectives. There is one other discrepancy between the proposal of the Commission redraft, Senate 715, and our nuclear liability insurance policy which I should bring to your attention. The insurance industry approach to date has been to issue a policy on a single location for a specified amount of coverage, and not an event. The bills which have heretofore been considered are on an event basis. We rejected the event concept in the development of our coverage for the reason that we felt that a lot of the claims would drag out for a long time. There would be delayed reporting, and so on, and it would be very difficult to determine the actual cost of an event. An amount of insurance per location was probably a sounder approach.

Representative COLE. I don't understand the difference. Would you explain it? I don't understand "event." I think I do, but I don't see the difference.

Mr. YOUNT. If an event happens today and something else happens 5 years from now and a claim is brought 10 years from now—which event is it chargeable to? We run into this type of case typically in chemical plants where certain things are happening with re-

spect to the discharge of gases, fumes, or waste products which build up a loss over a period of time—either to property or physical impairment of persons. Sometimes there is an episode in which a lot of damaging material is released at one time. Otherwise there may be a series of events. To which event are you going to relate the loss when it develops after a series of episodes?

Perhaps we are incorrect, but our feeling has been that it is going to be rather difficult on many claims in this area to pin the claims down. In any event, our approach to date has been to say, with respect to any installation, that we are willing to provide a certain amount of coverage.

Representative COLE. Even though there may be no event?

Mr. YOUNT. Even though there may be no event in that sense. For instance, you may get leakage regularly in some of these installations of a certain amount of fission products. It may be very minor. Claims may ultimately develop from this exposure.

The coverage which we in the insurance industry have been working on—and it has been an extremely tedious and time-consuming job—is in pretty fair shape, although we are going to have to continue to make changes as we learn more about the problem. It applies solely, of course, to installations within the United States. In connection with one of the questions that was raised here a bit earlier, our interpretation of the policy—which would differ a little bit from Mr. Haugh's—is that if the plant that we are talking about should let some fission products get over into Canada, our policy would cover. We do not cover foreign locations. We do not cover any plant or equipment located outside the country. But we do cover losses that arise from events within the country.

The CHAIRMAN. It applies also to Territories.

Mr. YOUNT. Territories, too. If there is any difference within our own ranks on that, we will have to iron them out. That has been our conception of the coverage. The area of coverage that is still left open, one with which we are vitally concerned and frankly don't know what to do with it, is the question that is being raised by our customers with respect to foreign sales. Particularly their liability for operating, during a period of testing time in foreign countries, reactors sold to those countries, and their continuing liability for products liability. This problem is much more acute in the nuclear field than in other types of industrial equipment for obvious reasons. Our customers obviously need insurance protection. The reason we have not been able to do anything about it to date is that most of our companies are strictly domestic companies, unlicensed in foreign countries, have no facilities abroad, have no means of finding out who is operating and how and under what conditions, no inspection facilities. So we have to look to the development of some foreign insurance capacity before we will have a firm resolution of that problem.

Now, the second area on which the chairman asked me to comment is that of rates. In that connection, Mr. Haugh has made a very fine presentation. I do not want to duplicate what he has covered. I merely would like to point out for you gentlemen that this has been a very difficult problem and will continue to be so for a long time. We have never before been asked to make rates for pure catastrophe coverage in such substantial amounts. If we were talking only about

ordinary limits of $25,000 or $50,000, we could experiment and take our chances. But when we are asking 239 companies to lay some $60 million on the line, if it is necessary, we have to try to develop rates which are going to keep those companies in the fold as insurers or reinsurers and we have to try to develop rates which at the same time will be reasonable so far as costs are concerned to our customers.

We don't know what kind of losses we are going to have. I would merely point out that if we have one $25 million loss in the next 5 or 10 years, that is certainly going to be a great deal more than the total amount of premium we expect to collect. The premiums are not going to come along rapidly. It takes time to get nuclear operations into existence and begin to operate on a basis where we earn premiums.

We have been concerned with rate relativities really more than absolute dollars of rates. We are trying to come up with a system under which there will be a reasonable rate relativity between the various types of exposure, with the idea that if we are too high at the end of 10 years our revolving rate plan on an industry basis will correct our general rate levels. In the event of no losses we will give back between 67 and 75 percent of the total premium we have collected on the first year, and so on as the years roll along. The reason for this kind of a plan should be obvious. We are dealing with pure catastrophe insurance. These funds will be placed in a special account and left there until something happens. We are putting a contractual provision on the policy that in the event the experience is good our policyholders are going to receive a return of a portion of premiums they have paid.

Representative COLE. Per company?

Mr. YOUNT. The pools. Premium will be refunded on the syndicate policies that are being issued.

Representative COLE. You don't propose to rebate to an individual operator?

Mr. YOUNT. We will rebate to the man who pays the premium—the power company which gets a policy.

Representative COLE. The rebate will apply to all policyholders and not to one.

Mr. YOUNT. It will apply to all uniformly; that is correct. We are doing that because we say this is an overall industry approach. We are trying to come out with a scale of relative charges. To the extent that we are too high across the whole range we will refund equally across the whole range. As Mr. Haugh said, the occurrence of a loss is going to be pure happenstance. Suppose the probability of loss is 1 in 100 or 1 in 200 or 1 in 500 years; it is a happenstance whether that particular facility happens to have an event or not. For that reason, the refunds are to be made across the board to all buyers of insurance on whatever the amount available proves to be, year by year, under this 10-year revolving plan.

We are feeling our way slowly on rates. There is a great deal we don't know about the subject. There is a great deal that is not known at all. There is no unanimity of view as to what might actually happen under the worst condition. There is not any unanimity of view as to the kind of personal injury claims you might actually get from various things that might happen. For that reason we feel that we have to make progress a little bit slowly.

The CHAIRMAN. You have not established rates as yet?

Mr. YOUNT. We have established rates, as Mr. Haugh expressed, on 5 or 6 reactors. This is being done by a joint committee of stock and mutual companies. They meet 1 or 2 days every couple of weeks. It looks like they are going to be busy for some time. They want to get the reactors out of the way as far as they can and move into the areas of fuel fabricating and that sort of thing which present difficult problems also.

Representative COLE. Is my understanding correct, Mr. Yount, that one policy covering a reactor is participated in by the mutual group and the stock group?

Mr. YOUNT. Let me explain that, if you will. If the policy is for a small amount either group may issue the policy depending on how the application comes in.

Representative COLE. And the other group will not participate?

Mr. YOUNT. The other group will reinsure a portion of that policy. We are splitting every risk on a uniform basis regardless of who issues the policy. We are sharing pro rata on all the expenses, including the inspection expense and the matters that involve the rating and that sort of thing. Each group shares in the total premium on a fixed basis. We have joint committees working, as I pointed out, almost constantly in implementing this situation. If there is more than an amount that either pool can handle through its own policies, there will be two separate policies issued, but in that event each is still reinsured by the other so in the end result the mutual companies will take a fixed percentage of the total coverage on a reactor and the stock companies a fixed percentage.

Representative COLE. Both groups have a concurrent determination of the rates that are determined?

Mr. YOUNT. The rates are being made by joint committees of the Mutual Insurance Rating Bureau and the National Bureau of Casualty Underwriters which are the two licensed rating organizations in this field.

Now, a third item which the chairman asked me to comment on, I hope briefly, has to do with the question of reactor safeguards reports. Some reference has been made in the hearing to a letter which I believe was written by us. All we have asked from the outset has been to make available to us all the information that can be made available by the risk. I think the phraseology in the letter referred to is perhaps a bit unfortunate. What we were after was all the information that was made available to the Commission and to the Reactor Safeguards Committee. We have been discussing this angle of information with the Commission for some 2 years through our liaison committees. They are in the process of working out arrangements whereby insurance representatives may sit in on Commission discussions of hazards with the risk. We have to get the permission of the risk to do that. We have taken the position that it is imperative that all the information that bears on the hazard be made available.

It has been explained to us from the outset that Reactor Safeguards Committee reports are treated as internal documents and are confidential. As far as we are concerned, we think that from an insurance standpoint we will get about what we need out of being able to

attend with our insured the sessions at which the Hazards Evaluation Committee of the Commission and the Reactor Safeguards Advisory Committee consider the problems involved.

If it should be decided as a matter of public policy that those reports should be made public, then we would want for our files anything from that report that bore on the hazard. As Mr. Haugh pointed out, we are not interested in seeing trade secrets made public. We think that this is a field in which some ingenuity should be permited, some initiative should be permitted, and to the extent that has a capital value, it might very well be kept confidential.

Senator ANDERSON. You would not regard a Reactor Safeguards Committee report as a trade secret, would you?

Mr. YOUNT. I have no idea what they look like, sir. I would say this: To the extent that the Reactor Safeguards Committee describes the hazards, and if that contains anything with respect to hazards that has not been made public, then we would like to be in a position to know something about it. But to the extent that such reports might go into special processes and special techniques that have no bearing on the hazard, I do not care whether it is public or not.

Senator ANDERSON. You people must have been interested in this. Six of them have been made public. You are not working in a vacuum. You could have read all six of them and if you can find a trade secret in one of them, you have somebody in our organization that is a genius, because there is no trade secret in a single one of them. I make that statement as flatly as I can.

Let me read you again what you folks suggested:

> Each of the installations in question at the present time must obtain approval from the Reactor Safeguards Committee of the AEC. In order to obtain this approval a detailed report must be submitted to the Committee outlining the nature of the installation and its surroundings as well as the steps taken to insure its safety. It is essential that the inspection committee have available for its consideration a copy of the report to the Reactor Safeguards Committee.

Mr. YOUNT. That is a copy of the report to the committee.

Senator ANDERSON. That is an internal document. If it is essential that you should have it, why shouldn't you have it?

Mr. YOUNT. I think that refers to the report which someone makes to the Reactor Safeguards Committee, Senator.

Senator ANDERSON. I still think that is an internal document or would be promptly classified as that if you asked for it.

Mr. YOUNT. I think it referred to their report to the committee.

Senator ANDERSON. Then we go to the letter of authorization from the buyer.

> This request for inspection should be accompanied by a letter of authorization signed by an officer of the company to be insured. This letter should authorize attendance of the members, the Mutual Atomic Energy Reinsurance Pool inspection committee at meetings of the Reactor Safeguards Committee, and staff meetings with AEC involving discussion of the installations to be insured. In the letter of authorization the applicant should also agree to supply copies of the Reactor Safeguards Committee reports to the inspection committee.

Have you changed your mind on that any?

Mr. YOUNT. All I can say, Senator—and I had not seen that letter, all I had seen was the letter from the risk, and I happened to see that incidentally—is that what we were asking for was all the material submitted to the Reactor Safeguards Committee. Our inspectors and

our people, I think, have been familiar with the fact that we were not entitled as of this date to reports of the committee itself.

Senator ANDERSON. You wanted only the background material supplied to the committee.

Mr. YOUNT. That we understood we were entitled to by asking for it.

Senator ANDERSON. Presumably somebody in your organization is going to evaluate that. It will also be evaluated by a group of very distinguished scientists who comprise this Reactor Safeguards Committee. Who do you have in your organization whose opinion you would place above the opinion of the Reactor Safeguards Committee?

Mr. YOUNT. Senator, that is——

Senator ANDERSON. I don't see how you can find anybody in the organization just frankly.

Mr. YOUNT. We have quite a distinguished physicist in our organization who has been involved in this and a consultant to the Atomic Energy Commission for some 10 or 12 years, I think, and is quite familiar with the whole development, and whose opinions on industrial health and safety I think I would take in preference to a great many people. That is nothing derogatory to any other gentlemen. We do happen to have such people.

Senator ANDERSON. We all have our family doctor that we would say in preference to the judgment of everybody else, but if we get bad we generally have a consultation. I can't see how you would be damaged financially or in any other way by having made available to you the study made by the Reactor Safeguards Committee.

Mr. YOUNT. If it is a matter of public policy that be made public, we would like to have it.

Senator ANDERSON. I am going to try to make it so. I tried to put that in a bill. I think it is important because we are dealing with lots of lives.

Mr. YOUNT. We want anything that bears on the hazards.

Senator ANDERSON. It is not just a question of the financial repayment that you make to a family that suffers some damage.

Mr. YOUNT. It is prevention.

Senator ANDERSON. Here comes the Reactor Safeguards Committee and pointed out that certain tests ought to be made on the Laguna Beach reactor before it was constructed. If you take the coldest possible financial look at it, if you are going to insure that reactor for $50 or $60 million and the Government is going to add indemnity for another $500 million, somebody ought to make that test. But it is going to be located near human beings and you don't want to expose those either. I was trying to see why we might not have these available to you. I think it is extremely important. I don't see how these could possibly be classified as an internal working document. I mean it is possible. But the public has an overriding and very strong interest in it. I think, from your own standpoint it would be extremely important to you. I don't doubt the qualifications of the people you have at all. Undoubtedly you will hire the very best people you can get.

Mr. YOUNT. Furthermore, Senator, we have arrangements, I think, in the process now by which those people will be permitted to sit down with the Commission technical staff and with the Reactor Safeguards

Advisory Committee when they are discussing an individual project. With that arrangement I think we are going to be given a great deal of information which bears on the hazards, and which would presumably only be supplemented by the conclusions which would be contained in the report of the Safeguards Committee.

Senator ANDERSON. What is the situation in England? They have a reactor operating. What is the limit of insurance over there?

Mr. YOUNT. As far as I know, they have not written any insurance yet. It is all a Government project to date.

Senator ANDERSON. Let me put it another way, then. Do you happen to know what insurance is going to be made available to private companies in England?

Mr. YOUNT. No; I do not know. I do know that the group that has been working with us to develop capacity between the stock and mutual groups on this side has developed a rather substantial capacity.

Senator ANDERSON. Is it not larger than the American pool?

Mr. YOUNT. The amount that has been developed to date is not as large as the physical damage pool. It is no larger than the combined liabilities pool. I understand that there will be additional capacity available for domestic use in England that won't be available on this reinsurance operation here. My information is secondhand on that. I can't give you an unqualified answer.

Representative PRICE. Mr. Chairman, I have just one question. I believe you were attempting to participate financially in the pool up to about $15 million. Were you able to reach that figure?

Mr. YOUNT. What we have done, Mr. Price, is to develop a net capacity of $11¼ million in round figures. We hope that foreign reinsurance will bring that up to $15 million. With the developments of automatic reinsurance with our stock friends it has been necessary for us to earmark a certain portion of that for liability only and a certain portion for physical damage so we will have a constant amount to work with. For that reason if we develop $15 million total capacity, only $10 million of it will be available for third party liability, and we would hold $5 million for physical damage.

Representative PRICE. That is all I have, Mr. Chairman.

The CHAIRMAN. Thank you very much, Mr. Yount. The committee is adjourned until 2 o'clock this afternoon.

(Correspondence from Mr. Yount regarding S. 1684 follows:)

LIBERTY MUTUAL INSURANCE CO., *April 2, 1957.*

Re: Reactor Safeguards Advisory Committee

Hon. CLINTON P. ANDERSON,
Congress of the United States,
Joint Committee on Atomic Energy

DEAR SENATOR ANDERSON: Upon my return from Washington I found a copy of your bill S. 1684 which had been sent to me by Mr. Ramey. I am glad to see something of this sort introduced. I have discussed the problem of this committee with a great many people during the past year because both our mutual companies and the stock companies are very much concerned about the continuation of such a strong impartial committee.

My reluctance last week as to whether the reports of this committee should become public documents is genuine, based upon uncertainty as to what the effects would be. In discussing the problem with various people I have run into the view that perhaps the most able people desirable on such a committee might be unwilling to serve if the report was to become a matter of public

controversy. If this should be the case my preference would be for a strong committee with some reservation as to making the complete committee report a public document.

I share your view expressed in your remarks accompanying the bill to the effect that the safety and welfare of the public must be a primary consideration. In this connection it would seem important that such a committee would be concerned not merely with private operations conducted under the licensing provision of the 1954 act but all phases of operation in the nuclear area. If the counsel and advice of such a committee serves a valuable purpose, as I believe it does, then it would appear appropriate to obtain their advice in all areas where unusual hazards prevail regardless of public or private financial support or operation.

In view of the present state of knowledge—or lack of it—with respect to nuclear hazards, it might be desirable to consider moving into full scale publicity by stages. I am sure that the feeling of our insurance industry is that the presence of a good committee which would function impartially is of more importance at this stage than complete disclosure of such committee's conclusions. Ultimately we believe that the objectives of your bill must prevail but have a question as to timing.

Cordially yours,

HUBERT W. YOUNT, *Vice President.*

(Thereupon, at 12:15 p. m., a recess was taken until 2 p. m. the same day.)

AFTERNOON SESSION

The CHAIRMAN. The committee will come to order. This is a continuation of the hearings on S. 715 and H. R. 1981.

Mr. Kenneth E. Black, president of the Home Insurance Co. is the first witness this afternoon. We are glad to have you come down and give us your thoughts on this piece of legislation.

STATEMENT OF KENNETH E. BLACK, CHAIRMAN, GOVERNING COMMITTEE, NUCLEAR ENERGY PROPERTY INSURANCE ASSOCIATION

Mr. BLACK. Thank you, sir. I would like to read a statement, sir, with your permission.

The CHAIRMAN. You may proceed.

Mr. BLACK. My name is Kenneth E. Black. I am president of the Home Insurance Co. and chairman of the governing committee of the Nuclear Energy Property Insurance Association.

The Nuclear Energy Property Insurance Association comprises 186 stock insurance companies and has been organized for the basic purpose of providing property insurance protection against hazards arising out of or pertaining to—

(*a*) nuclear reactor installations designed for experimental, testing, or power purposes, and

(*b*) operations or facilities related or incident thereto.

This organization has already been qualified to do business in 42 States, and the qualification in other States is anticipated promptly. As a matter of fact, there may be more than I have reported here since this memorandum was dictated. The capacity of this association amounts to approximately $60 million per risk which, as far as we know, is ample for all foreseeable needs.

In addition, we have organized a bureau to establish rates applying to insurance against physical damage to nuclear facilities. This rating bureau will establish rates in all States of the United States where necessary and meet the test of the various rate laws in those

States with respect to—"they shall not be excessive, inadequate, or unfairly discriminatory." This rating organization has already been licensed in 26 States and application is pending in all other States. We expect the completion of this program momentarily.

We have developed an all-risk insurance policy which has been completed and filed—or is in the process of being filed—in the 26 States in which the association and its rating organizations have qualified. It has already been approved in the State of New York. The filing in other States, of course, is currently being made concurrently with the qualifying of our association and rating organization in those States.

In short, we are prepared and ready to issue a policy of insurance on these risks within our capacity so to do, and we have a rating plan and formula to be applied on individual risks, and are prepared to do business.

With respect to the proposed legislation before this committee, and particularly S. 715, we feel that it would give private enterprise an opportunity to assist in this program of nuclear development and, in principle, endorse the intent and purpose of the proposed legislation.

I did not prepare, sir, rates for presentation to this committee, but I have with me the chairman of the executive committee of our rating organization who is prepared to discuss our rate structure, if you care to.

In addition, if you care we would like to submit a memorandum and take 5 or 6 or more, if you desire, hypothetical locations or specific locations and submit that to this committee for your further information and guidance.

The CHAIRMAN. Thank you very much, Mr. Black. I want to congratulate you on your statement.

Mr. BLACK. Thank you, sir.

The CHAIRMAN. Can you furnish the committee a copy of the policy to be inserted in the record?

Mr. BLACK. Yes, sir.

The CHAIRMAN. We should like to have that. Without objection it will be placed in the record.

(The information referred to follows:)

THE HOME INSURANCE CO.,
New York, April 12, 1957.

Re Nuclear Energy Property Insurance Association.

JOINT COMMITTEE ON ATOMIC ENERGY,
United States Senate, Washington 25, D. C.

GENTLEMEN: In accordance with my testimony before your committee on March 26, 1957, I enclose a copy of our policy form as filed with the several State insurance departments.

William H. Berry, vice president of the America Fire Insurance Group and chairman of the executive committee of the Nuclear Insurance Rating Bureau, is submitting to you an illustrative outline of our rating plan as applied to various locations.

With respect to the amendments to S. 715 proposed by the Atomic Energy Commission, it is my judgment that all are unobjectionable from our point of view and appear to be in furtherance of the general objectives of the legislation.

On behalf of those I represented, in the Nuclear Energy Property Insurance Association, permit me to thank your committee for the opportunity to have appeared before you.

Very truly yours,

K. E. BLACK, *President.*

POLICY OF NUCLEAR ENERGY PROPERTY INSURANCE (SPECIMEN)

DECLARATIONS

NUCLEAR ENERGY PROPERTY INSURANCE ASSOCIATION, 85 JOHN STREET, NEW YORK 38, N. Y.

Rate _____ Policy No. _____
Premium _____ Issued in New York, N. Y., on _____, 19___.
Item 1. Name of insured _____
Mailing address _____
No. Street Town or city State
Item 2. The policy period shall be for the term of 1 year from _____, 19___ to _____, 19___, beginning and ending at noon, Standard Time at location of property insured as specified herein.
Item 3. Operator of facility _____
Mailing address _____
No. Street Town or city State
Atomic Energy Commisison license No. _____
Item 4. (*a*) Unless otherwise stated herein, the insured is the sole and unconditional owner of the insured property: Exceptions (if any):

Type of encumbrance:	Amount of encumbrance:
_____	_____
_____	_____
_____	_____

(*b*) Loss, if any, is payable as interest may appear to the insured and _____
(Name and address)
Item 5. Insured property.
Location No. 1. Type of facility and description of premises.
Amount of insurance $_____. Deductible $_____
Location No. 2. Type of facility and description of premises.
Amount of insurance $_____. Deductible $_____
Location No. 3. Type of facility and description of premises.
Location No. 4. Type of facility and description of premises.
Location No. 5. Type of facility and description of premises.

COUNTERSIGNATURE

Countersigned _____, 19___, at _____
_____ by _____
(Authorized representative)

NUCLEAR ENERGY PROPERTY INSURANCE ASSOCIATION, 85 JOHN STREET, NEW YORK 38, N. Y.

The Insurance Companies, Corporations, or Underwriters named herein and hereafter referred to as "Insurers", each for itself, severally and not jointly, and in the respective proportions hereinafter set forth, in consideration of the premium, in reliance upon the statements in the Declarations, and subject to the provisions and stipulations herein or added hereto, AGREE to indemnify the Insured and legal representatives, to the extent of the actual cash value of the property at the time of loss, but not exceeding the amount which it would cost to repair or replace the property with material of like kind and quality within a reasonable time after such loss, without allowance for any increased cost of repair or reconstruction by reason of any ordinance or law regulating construction or repair, and without compensation for loss resulting from interruption of business or manufacture, nor in any event for more than the interest of the Insured, against Radioactive Contamination and all Other Risks of Direct Physical Loss, Except as Hereinafter Provided, to the property described in the Declarations and situated at the location(s) specified therein.

This policy is made and accepted subject to the foregoing provisions and stipulations and those hereinafter stated, which are hereby made a part of this policy, together with such other provisions, stipulations and agreements as may be added hereto, as provided in this policy. The policy period and the amount(s) of insurance are stated in the Declarations.

The liability of the Insurers is several and not joint. Each Insurer shall be liable for that part only of any loss payable hereunder according to the percentage set opposite its name in the schedule of Subscribing Insurers at the end of this policy, and the maximum liability of each Insurer shall in no event ex-

ceed its said percentage of the total amount of insurance hereunder. While all liabilities hereunder are assumed solely by the individual Insurers, any right granted hereunder to the Insurers may be exercised on their behalf, with full force and effect, by the General Manager of the Nucler Energy Property Insurance Association.

DEBRIS REMOVAL

Whenever used in this policy, the term "loss" shall include expenses necessarily incurred by the Insured in removing all debris of the property covered, remaining after physical damage to such property caused directly by any peril not excluded hereunder. In no event shall this policy cover against loss occasioned by enforcement of any law, ordinance, or order of any State, municipality or other governmental authority which necessitates the demolition of any portion of the property covered hereunder which remains undamaged.

PROPERTY OF OTHERS

Subject to all its other provisions and stipulations, this policy, without increase in the amount(s) thereof, also covers property of officers and employees of the Insured, and such loss to property of others against which the Insured, prior to loss, has agreed to provide insurance, or for which the Insured is liable, all while said property is situated on the premises described herein; such loss, however, shall be adjusted with and payable to the named Insured.

REMOVAL FROM PREMISES

If property covered hereunder is necessarily removed from the described premises for preservation from imminent physical damage, this policy also covers, for a period of ten days, during removal and at any place to which such property has been removed.

EXCLUSIONS

This policy does not insure against direct or indirect loss by:

(1) gradual accumulation of radioactive contamination;

(2) radioactive contamination at any location specified in the Declarations, resulting from matter released from any source outside the premises of that location;

(3) neglect of the Insured to use all reasonable means to save and preserve the property at and after a loss, or when the property is in danger of physical damage;

(4) unexplained or mysterious disappearance of property, or shortage disclosed upon taking inventory;

(5) any fradulent, dishonest, or criminal act done by or at the instigation of any Insured, partner or joint adventurer in or of any Insured, an officer, director or trustee of any Insured;

(6) order of civil authority except acts of destruction at the time of and for the purpose of preventing the spread of fire, provided that such fire did not originate from "War Risk" as herein excluded;

(7) theft, pilferage, burglary, larcency; appropriation or concealment of any property by any person to whom the property covered is entrusted;

(8) perforation of fuel element cladding;

(9) depletion, depreciation, deterioration or wear and tear;

(10) or attributable to manufacturing or processing operations which result in damage to stock or materials while such stock or materials are being actually worked upon;

(11) dampness, dryness, or extremes or changes of temperature of the atmosphere; rust, corrosion or erosion;

(12) flood however caused, inundation, surface waters, high water or overflow, waves, tide or tidal wave, or spray therefrom, including the backing up of sewers and drains resulting from any of the foregoing; all whether or not caused by water inundating or flooding land, the rising of or the breaking of boundaries of natural or manmade lakes, reservoirs, rivers or other bodies of water, or the accumulation on land of water from natural sources; and all whether driven by wind or not, or whether caused by or attributable to earthquake or other earth movement;

(13) seepage, leakage or influx of water from natural sources through basement walls, including doors, windows and other openings therein, foundations, basement floors, sidewalks or sidewalk lights;

(14) earthquake, volcanic eruption, landslide, subsidence or sinking of land or other earth movement, settlement or other movement of foundations, unless otherwise provided in writing hereon, or by endorsement added hereto.

The foregoing Exclusions 7 to 14 inclusive, shall not apply to ensuing loss by fire, explosion, radioactive contamination or any other peril not otherwise excluded.

This policy does not cover:

(15) accounts, bills, currency, deeds, evidences of debt, money or securities;

(16) books of records, manuscripts, drawings, card index systems and other records, for loss in excess of the cost of blank books, blank cards and other materials plus the actual cost of labor in transcribing or copying such records; film, for loss in excess of the cost of unexposed film;

(17) land, unless otherwise provided in writing hereon or by endorsement added hereto;

(18) animals, lawns, plants and shrubs;

(19) aircraft, watercraft, or vehicles licensed for highway use.

WAR RISK EXCLUSION

This policy does not cover loss caused directly or indirectly by:

1. Hostile or warlike action in time of peace or war, including action in hindering, combating or defending against an actual, impending or expected attack

(a) by any government or sovereign power (de jure or de facto), or by any authority maintaining or using military, naval or air forces; or

(b) by military, naval or air forces; or

(c) by an agent of any such government, power, authority or forces;

it being understood that any discharge, explosion or use of any weapon of war employing nuclear fission or fusion shall be conclusively presumed to be such a hostile or warlike action by such a government, power, authority or forces;

2. Insurrection, rebellion, revolution, civil war, usurped power, or action taken by governmental authority in hindering, combating or defending against such an occurrence.

COINSURANCE

The Insurers shall not be liable for a greater proportion of any loss to the property described herein (including debris removal expense) than the sum hereby insured bears to ninety percent (90%) of the actual cash value of said property at the time such loss shall happen, nor for more than the proportion which this policy bears to the total insurance thereon.

In the event that the aggregate claim for any loss is both less than ten thousand dollars ($10,000) and less than five percent (5%) of the total amount of insurance upon the property specified herein at the time such loss occurs, no special inventory or appraisement of the undamaged property shall be required, but this shall not be construed as a waiver of the coinsurance provision.

If this policy covers two or more locations as specified in the Declarations, the provisions of the Coinsurance Clause shall apply to each location separately.

DEDUCTIBLE

From the amount of each and every loss to the property described herein, after application of the provisions of the Coinsurance Clause, there shall be deducted the amount stipulated in the Declaration for each specified location to determine the net loss payable.

In the event the Insurers' proportion of loss at any location, after application of the provisions of the Coinsurance Clause, exceeds fifty percent (50%) of the amount of insurance applicable to such location under this policy, this Deductible Clause shall not be applied.

It is a condition of this policy that the deductible amount(s) specified in the Declarations shall be solely at the risk of the Insured, and shall not be covered under any other policy of insurance.

APPORTIONMENT

The Insurers shall not be liable (1) for a greater proportion of any loss than the amount of insurance under this policy bears to the whole amount of insurance written upon the identical terms, provisions and stipulations contained in this policy, whether collectible or not, nor (2) for a greater proportion of any loss than the amount hereby insured bears to all insurance, whether collectible or not, covering in any manner such loss or which would have covered such loss except for the existence of this insurance; except that if any type of insurance not written upon the identical terms, provisions and stipulations contained in this policy applies to any loss to which this insurance also applies or would have applied to any such loss except for the existence of this insurance, the limit of liability of each type of insurance for such loss, hereby designated as "joint loss", shall first be determined as if it were the only insurance, and this type of insurance shall be liable for no greater proportion of joint loss than the limit of its liability for such loss bears to the sum of all such limits. The liability of the Insurers for such joint loss shall be limited to their proportionate part of the aggregate limit of this and all other insurance of the same type. The words "joint loss", as used in the foregoing, mean that portion of the loss in excess of the highest deductible, to which this insurance and other types of insurance above referred to both apply.

Concealment, Fraud. This entire policy shall be void if, whether before or after a loss, the Insured has wilfully concealed or misrepresented, in the Declarations or otherwise, any material fact or circumstance concerning this insurance or the subject thereof, or the interest of the Insured therein, or in case of any fraud or false swearing by the Insured relating thereto.

Policy Modifications. There shall be no change in the terms, provisions and stipulations of this policy except in writing hereon or by endorsement added hereto by the Insurers.

Waiver Provisions. No provision, stipulation or forfeiture shall be held to be waived by any requirement or proceeding on the part of the Insurers relating to appraisal or to any examination provided for herein.

Assignment. Assignment of this policy shall not be valid except with the written consent of the Insurers or their Authorized Agent.

Cancellation of Policy. This policy may be canceled at any time at the request of the Insured, in which case the Insurers shall retain an earned premium pro rata for the term the policy was in force but not less than the premium that would have been earned for a full six months' period, and the Insurers shall upon surrender of the policy refund the excess of paid premium above any earned premium. This policy may be canceled at any time by the Insurers by mailing or delivering to the Insured a thirty days' written notice of cancellation with or without tender of the excess of paid premium above the pro rata premium for the expired time, which excess, if not tendered, shall be refunded on demand. Notice of cancellation shall state that said excess premium (if not tendered) will be refunded on demand.

Inspection and Suspension. The Insurers shall be permitted at all reasonable times during the policy period to inspect the property insured hereunder. Upon discovery of a dangerous condition with respect to any machine, vessel, or part thereof, a representative of the Insurers may request that such machine, vessel, or part thereof be taken out of service without delay so that corrective measures may be instituted. In the event of noncompliance with such request, the representative of the Insurers may immediately suspend the insurance as to any loss arising out of any incident resulting from such noncompliance by written notice mailed or delivered to the Insured with similar notice to the mortgagee, if any. The insurance so suspended may be reinstated by the Insurers, but only by an endorsement issued to form a part of this policy.

Mortgage Interests and Obligations. If loss hereunder is made payable, in whole or in part, to a designated mortgagee not named herein as the Insured, such interest in this policy may be canceled by mailing or delivering to such mortgagee a thirty days' written notice of cancellation.

If the Insured fails to render proof of loss such mortgagee, upon notice, shall render proof of loss in the form herein specified within sixty (60) days thereafter and shall be subject to the provisions hereof relating to appraisal and time of payment and of bringing suit. If the Insurers shall claim that no liability existed as to the mortgagor or owner, they shall, to the extent of payment of loss to the mortgagee, be subrogated to all the mortgagee's rights of recovery, but without impairing mortgagee's right to sue; or they may pay off the mortgage

debt and require an assignment thereof and of the mortgage. Other provisions relating to the interests and obligations of such mortgagee may be added hereto by agreement in writing.

Requirements in Case of Loss. The Insured shall give immediate written notice to the Insurers of any loss, protect the property from further damage, forthwith separate the damaged and undamaged personal property, put it in the best possible order, furnish a complete inventory of the destroyed, damaged and undamaged property, showing in detail quantities, costs, actual cash value and amount of loss claimed; and within sixty days after the loss, unless such time is extended in writing by the Insurers, the Insured shall render to the Insurers a proof of loss, signed and sworn to by the Insured, stating the knowledge and belief of the Insured as to the following; the time and origin of the loss, the interest of the insured and of all others in the property, the actual cash value of each item thereof and the amount of loss thereto, all encumbrances thereon, all other contracts of insurance, whether valid or not, covering any of said property, and changes in the title, use, occupation, location, possession or exposures of said property since the issuing of this policy, by whom and for what purpose any building herein described and the several parts thereof were occupied at the time of loss and whether or not it then stood on leased ground, and shall furnish a copy of all the descriptions and schedules in all policies and, if required, verified plans and specifications of any building, fixtures or machinery destroyed or damaged. The Insured, as often as may be reasonably required, shall exhibit to any person designated by the Insurers all that remains of any property herein described, and submit to examinations under oath by any person named by the Insurers, and subscribe the same; and, as often as may be reasonably required, shall produce for examination all books of account, bills, invoices and other vouchers, or certified copies thereof if originals be lost, at such reasonable time and place as may be designated by the Insurers or their representative, and shall permit extracts and copies thereof to be made.

Appraisal. In case the Insured and the Insurers shall fail to agree as to the actual cash value or the amount of loss, then, on the written demand of either, each shall select a competent and disinterested appraiser and notify the other of the appraiser selected within twenty days of such demand. The appraisers shall first select a competent and disinterested umpire; and failing for fifteen days to agree upon such umpire, then, on request of the Insured or the Insurers, such umpire shall be selected by a judge of a court of record in the state in which the property covered is located. The appraisers shall then appraise the loss, stating separately actual cash value and loss to each item; and, failing to agree, shall submit their differences, only, to the umpire. An award in writing, so itemized, of any two when filed with the Insurers shall determine the amount of actual cash value and loss. Each appraiser shall be paid by the party selecting him and the expenses of appraisal and umpire shall be paid by the parties equally.

Insurer's Options. It shall be optional with the Insurers to take all, or any part, of the property at the agreed or appraised value, and also to decontaminate or otherwise repair, or to rebuild or replace the property destroyed or damaged with other of like kind and quality within a reasonable time, on giving notice of its intention so to do within thirty days after the receipt of the proof of loss herein required.

Abandonment. There can be no abandonment to the Insurers of any property.

When Loss Payable. The amount of loss for which the Insurers may be liable shall be payable sixty days after proof of loss, as herein provided, is received by the Insurers and ascertainment of the loss is made either by agreement between the Insured and the Insurers expressed in writing or by the filing with the Insurers of an award as herein provided.

Suit. No suit or action on this policy for the recovery of any claim shall be sustainable in any court of law or equity unless all the requirements of this policy shall have been complied with, and unless commenced within twelve months next after inception of the loss.

Subrogation. The Insurers may require from the insured an assignment of all right of recovery against any party for loss to the extent that payment therefor is made by the Insurers; however, prior to a loss, the insured may waive in writing any or all right of recovery against any party for loss occurring to the property covered hereunder.

Reduction of Policy Amount by Loss and Aggregate Limit of Liability. Every loss occurring hereunder reduces, as of the date of the occurrence causing such

loss, the amount of insurance under this policy at the location where such loss occurs, by the amount of such loss and this policy shall apply thereafter only for the reduced amount unless otherwise provided by endorsement added hereto. The amount of insurance at any location as stated in the declarations is the total aggregate limit of the insurers' liability for all losses occurring within the policy period at that location.

Conformity to Statute. Any provision or stipulation of this policy which is in conflict with the statutes of the state(s) wherein the property covered hereunder is located is hereby amended to conform to such statutes.

IN WITNESS WHEREOF, the Subscribing Insurers have caused this Policy to be executed and attested on their behalf by the General Manager of the Nuclear Energy Property Insurance Association, and duly countersigned on the Declarations page by an authorized representative, but this policy shall be binding upon each Insurer only to the extent of the below-designated proportion of any obligation assumed or expense incurred under this policy.

For the Subscribing Insurers:

W. H. FORRISTALL,
General Manager, Nuclear Energy Property Insurance Association.

Subscribing insurers

Insurer	Proportion of 100 percent
Aetna Casualty and Surety Co., The	
Aetna Insurance Co	
Affiliated Fire & Marine Insurance Co	
Agricultural Insurance Co	
Allstate Insurance Co	
Alpina Insurance Co., Ltd	
American Casualty Co	
American Central Insurance Co	
American Employers' Insurance Co	
American Equitable Assurance Co	
American Fire & Casualty Co	
American General Insurance Co	
American Home Assurance Co	
American Indemnity Co	
American Insurance Co, The	
American Liberty Insurance Co	
American Motorists Insurance Co	
American States Insurance Co	
American Surety Co	
American Title & Insurance Co	
American Universal Insurance Co	
Atlas Assurance Co., Ltd	
Baloise Marine Insurance Co., Ltd., The	
Bankers Fire & Marine Insurance Co	
Bankers & Shippers Insurance Company of New York	
Birmingham Fire & Casualty Co	
Boston Insurance Co	
British General Insurance Co., Ltd	
Buckeye Union Fire Insurance Co., The	
Buffalo Insurance Co	
California Insurance Co	
Camden Fire Insurance Association, The	
Canadian Fire Insurance Co., The	
Centennial Insurance Co	
Central Surety & Insurance Corp	
Century Insurance Co., Ltd., The	
Christiania General Insurance Corp. of New York	
Commercial Standard Insurance Co	
Commercial Union Assurance Co., Ltd	
Commercial Union Fire Insurance Company of New York, The	
Commonwealth Insurance Company of New York, The	
Constellation Insurance Co	
Constitution Insurance Corp	
Continental Casualty Co	
Continental Insurance Co., The	
Dubuque Fire & Marine Insurance Co	
Eagle Fire Insurance Co	
Empire Fire & Marine Insurance Co	
Employers' Fire Insurance Co., The	
Employers Insurance Co. of Alabama, Inc	
Employers' Liability Assurance Corp., Ltd., The	
Excelsior Insurance Company of New York	
Export Insurance Co	
Federal Insurance Co	
Federal Title & Insurance Corp	
Fidelity-Phenix Fire Insurance Co	
Fire Association of Philadelphia	

Subscribing insurers—Continued

Insurer	Proportion of 100 percent
Fire & Casualty Insurance Co., of Conn., The	
Fireman's Fund Insurance Co	
Firemen's Insurance Company of Newark, N. J	
French Union & Universal Insurance Co., The	
General Accident Fire & Life Assurance Corp., Ltd	
General Guaranty Insurance Co	
General Insurance Company of America	
General Insurance Company of Trieste and Venice (U. S. branch)	
General Security Assurance Corp. of New York	
Glen Falls Insurance Co	
Great American Insurance Co	
Great Southwest Fire Insurance Co	
Gulf Insurance Co	
Halifax Insurance Co. of Mass., The	
Hanover Fire Insurance Company, The	
Hartford Fire Insurance Co	
Hartford Steam Boiler Inspection & Insurance Co., The	
Home Insurance Co., The	
Home Insurance Company of Hawaii, Ltd	
Homeland Insurance Co. of America, The	
Imperial Insurance Inc	
Indiana Insurance Co	
Industrial Indemnity Co	
Insurance Company of North America	
Insurance Company of the State of Pennsylvania	
Inter-Ocean Reinsurance Company	
Interstate Fire & Casualty Company	
Jefferson Insurance Company of New York	
Jersey Insurance Company of New York	
Lafayette Insurance Co	
LaPaternelle Fire & General Ins. Co., Ltd	
London Assurance Co., The	
London & Lancashire Ins. Co. Ltd., The	
Maritime Insurance Co., Ltd	
Marquette Casualty Co	
Maryland Casualty Co	
Massachusetts Bonding & Insurance Co	
Mayflower Insurance Co., The	
Mercantile Insurance Co. of America, The	
Merchants Fire Assurance Corp. of N. Y	
Merchants Property Insurance Company of Indiana, The	
Metropolitan Fire Assurance Company	
Michigan Fire & Marine Insurance Co	
Millers National Insurance Co	
Monarch Insurance Co. of Ohio, The	
National Automobile & Casualty Ins. Co	
National Fire Insurance Co. of Hartford	
National Service Fire Insurance Co	
National Union Fire Insurance Co	
New Amsterdam Casualty Co	
New England Insurance Co	
New Hampshire Fire Insurance Co	
New Rotterdam Insurance Co	
New Zealand Insurance Co. Ltd., The	
Niagara Fire Insurance Co	
North British & Mercantile Ins. Co. Ltd	
Northeastern Insurance Company of Hartford	
Northern Assurance Company Limited, The	
Northern Insurance Company of New York	
Northwestern National Insurance Co	
Norwich Union Fire Insurance Society, Ltd	
Ohio Farmers Insurance Co	
Olympic Insurance Co	
Pacific Employers Insurance Co	
Pacific Fire Insurance Co	
Pacific National Fire Insurance Co	
Palatine Insurance Co., Ltd., The	
Pearl Assurance Co., Ltd	
Peerless Insurance Co	
Pennsylvania Fire Insurance Company, The	
Phoenix Assurance Company of New York	
Phoenix Insurance Co., The	
Preferred Insurance Co	
Providence Washington Insurance Co	
Prudential Insurance Company of Great Britain, The	
Reliance Marine Insurance Co., Ltd	
Royal Exchange Assurance	
Royal Insurance Company, Ltd	
St. Louis Fire and Marine Insurance Co	
St. Paul Fire & Marine Insurance Co	
San Jacinto Insurance Co	
Scottish Union & National Insurance Co	
Secured Insurance Co	

Subscribing insurers—Continued

Insurer	Proportion of 100 percent
Security Insurance Co	
Security Insurance Company of New Haven	
Skandinavia Insurance Co., Ltd	
Southern General Insurance Co	
Southwestern Fire & Casualty Co	
Springfield Fire & Marine Insurance Co	
Standard Accident Insurance Co	
Standard Fire Insurance Co	
Standard Fire Insurance Co. of New Jersey	
Standard Insurance Co., The	
State Farm Fire & Casualty Co	
Sun Insurance Office, Ltd	
Switzerland General Insurance Co., Ltd	
Tokio Marine & Fire Insurance Co., Ltd	
Travelers Indemnity Co., The	
Trinity Universal Insurance Co	
Tri-State Insurance Co	
Underwriters Insurance Co	
Union Assurance Society, Ltd	
Union Insurance Society of Canton, Ltd	
Union & Phenix Espanol Insurance Co	
United Benefit Fire Insurance Co	
United Fire & Casualty Co	
United Pacific Insurance Co	
United States Casualty Co	
United States Fidelity & Guaranty Co	
United States Fire Insurance Co	
Unity Fire & General Insurance Co., The	
Universal Insurance Co	
Urbaine Fire Insurance Co	
Wabash Fire & Casualty Insurance Co	
Washington General Insurance Corp	
Western Fire & Indemnity Co	
Western Fire Insurance Co., The	
Western Pacific Insurance Co	
Yorkshire Insurance Co. of New York, The	
Zurich Insurance Co	

Representative COLE. How does it differ from the policy that Mr. Haugh was going to submit?

Mr. BLACK. Bear in mind, sir, we are insuring the property and not the liability.

Representative COLE. Earlier I asked Mr. Haugh to submit a memorandum, discussing the changes in the bill, Senate 715, which had been recommended by the Commission. Would you do likewise, or to facilitate it, perhaps collaborate with him in the preparation of such a memorandum?

Mr. BLACK. I would be very glad to prepare and submit such a memorandum. (See letter, p. 131.)

Representative COLE. I do not have any particular questions on the rate structure unless they vary substantially from the examples which Mr. Haugh presented.

Mr. BLACK. There would be no connection between his rate structure and what we propose.

Representative COLE. This fund of $60 million to which your statement has referred applies to property protection of the reactor owner?

Mr. BLACK. That is right.

Representative COLE. As well as to the public?

Mr. BLACK. No; it does not apply to the public.

Representative COLE. Then there are two funds?

Mr. BLACK. That is correct.

Representative COLE. Each in the amount of $60 million from the stock companies. One fund is to take care of public liability and the other fund to take care of protection to the owner.

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Mr. BLACK. Our fund represents the insuring of the structure owned by the reactor owner. I represent basically fire insurance companies.

The CHAIRMAN. Have you somebody here who can give us the rate structure on the same type of plant that Mr. Haugh gave us this morning?

Mr. BLACK. We can give you rate information, sir, and our basic principle of rating. We have not prepared specific examples for you, which I am perfectly willing to do and submit in memorandum form if you desire.

The CHAIRMAN. I think that would be better since you can apply them to specific plants.

Mr. BLACK. Yes, sir.

Representative COLE. In determining your rates you would not take into consideration the locality of the plant, with respect to sparsely or thickly populated areas.

Mr. BLACK. That would not be a controlling factor.

Representative COLE. Would it be a factor of any degree?

Mr. BLACK. I would doubt that it would. We would be more interested in construction of the building.

Representative COLE. Mr. Haugh enumerated five elements in determining the rate of his indemnity problem.

Mr. BLACK. Yes.

Representative COLE. What ones of those five would not be involved in determining your rates?

Mr. BLACK. If you want to discuss rates and rating formula would it be agreeable if I ask Mr. Berry, who is chairman of our rating organization to discuss that?

The CHAIRMAN. Will you give your name to the reporter?

STATEMENT OF WILLIAM H. BERRY, CHAIRMAN, EXECUTIVE COMMITTEE, NUCLEAR INSURANCE RATING BUREAU

Mr. BERRY. My name is William H. Berry. I am vice president of the America Fore Group of Fire and Casualty Insurance Companies and chairman of the executive committee of the Nuclear Insurance Rating Bureau.

Representative COLE. Of these 186 constituent companies in your group, is that the same number and the same individual companies that are in the Haugh group?

Mr. BLACK. Ours would be fire companies, sir; Mr. Haugh's group would be casualty companies.

Mr. BERRY. Mr. Chairman, speaking to Mr. Cole's question specifically, where the casualty people take into consideration 5 elements in their rating program, we take into consideration only 4—the same 4 as the casualty folks with the exception of the locale of the property. The only possible place where our rate would vary—and this is strictly a technicality—would be consistent with the fire protection of a relative area as respects the basic fire rate that we will use in our calculation.

Representative COLE. Later on you are going to submit the details of your rating structure.

Mr. BLACK. We would be glad to.

Representative COLE. Have you computed your rates as to the kilowatt cost, as Mr. Haugh has?

Mr. BERRY. No, sir; I have not. We will include that in our memorandum if that would be helpful to you.

(Correspondence from Mr. Berry, regarding proposed insurance rates for property coverage for nuclear power plants follows:)

NUCLEAR INSURANCE RATING BUREAU,
New York, N. Y., April 12, 1957.

JOINT COMMITTEE ON ATOMIC ENERGY,
United States Senate, Washington 25, D. C.

GENTLEMEN: Mr. Kenneth E. Black, president of the Home Insurance Co. of New York and chairman of the governing committee of the Nuclear Energy Property Insurance Association, and the writer, were privileged to appear before your committee on March 26, 1957. During the course of our presentation we agreed to furnish a memorandum dealing with the approximate rates, rating structure, and estimated cost per kilowatt-hour for several nuclear power reactor installations.

As brought out in our testimony, the policy of insurance which will be issued by the Nuclear Energy Property Insurance Association and the Mutual Atomic Energy Reinsurance Pool provides coverage for all of the reactor owner's property at the described location against the following:

1. Conventional perils of fire, plus those under the extended coverage endorsement and vandalism and malicious mischief;
2. Conventional boiler and machinery exposures;
3. Nuclear hazards including radioactive contamination; and,
4. All other perils not otherwise specifically mentioned and not excluded in the policy form.

A composite rate for use with the aforementioned policy when written by either syndicate (NEPIA or MAERP) will be promulgated by the Nuclear Insurance Rating Bureau, a national rating bureau presently licensed in 36 States with applications for licenses on file and pending in all other States and the District of Columbia. The plan of rating, as next described, has of this date been approved in 17 States.

In establishing the composite rate, the Nuclear Insurance Rating Bureau will be guided by the rating bureau of the State in which the insured property is located, as to the conventional fire, extended coverage, and vandalism and malicious mischief rates. For the boiler and machinery component, the Nuclear Insurance Rating Bureau will use a premium as recommended by the boiler and machinery rating committee of the National Bureau of Casualty Underwriters. In the case of a powerplant, for instance, it is anticipated that the charges for the above coverages will be practically the same as the rates and premiums now applicable to a conventional coal, gas, or oil-fired steam plant.

The increment in rate for the nuclear hazard including radioactive contamination will be established by the Nuclear Insurance Rating Bureau. Its filed rating plan provides for the evaluation of each reactor installation on its merits taking into consideration the type of reactor, its use, power level, and any features of containment.

Finally, a nominal charge will be added for the all-risk feature. The long-established Inland Marine Insurance Bureau will be called upon by the Nuclear Insurance Rating Bureau to recommend a proper charge for this portion of the coverage.

As an example of the above-outlined rating procedure, the makeup of the approximate composite rate per $100 of insurance for a boiling-water type power reactor with a rated capacity of 600-plus megawatts of heat and fully contained would be:

1. (*a*) Fire (90 percent coinsurance—same as conventional steam plant)	$0.07
(*b*) Extended coverage (90 percent coinsurance—same as conventional steam plant)	.016
(*c*) Vandalism and malicious mischief (90 percent coinsurance—same as conventional steam plant)	.004
2. Boiler and machinery (conventional steam plant including turbogenerator	.075

3. Nuclear hazard including radioactive contamination		.31
(*a*) Reactor type	$0.175	
(*b*) Use	-----	
(*c*) Power level	.085	
(*d*) Containment	.05	
	.310	
4. All-risk overlay for perils not included above		.02
Composite rate per $100 insurance		.495

Assuming property damage insurance in the amount of $40 million being adequate for the installation to comply with the provisions of the 90 percent coinsurance clause, the annual cost for this all-risk property damage coverage at $0.495 per $100 insurance would be $198,000.

Assuming the gross electric generating capacity of this installation to be 180,000 kilowatts with an operating factor of 60 percent, the estimated annual cost of $198,000 for this insurance would break down to approximately two-tenths of a mill (0.209 mills) per kilowatt-hour. With an operating factor of 80 percent the cost per kilowatt-hour would drop to approximately sixteen hundredths of a mill (0.16 mills).

As a second example, assume a pressurized-water type power reactor with a rated capacity of 480 megawatts of heat and fully contained. The makeup of the approximate composite rate under these conditions would be:

1. (*a*) Fire (90 percent coinsurance— same as conventional Steam plant)		$0.07
(*b*) Extended coverage (90 percent coinsurance—same as conventional steam plant)		.016
(*c*) Vandalism and malicious mischief (90 percent coinsurance—same as conventional steam plant)		.004
2. Boiler and machinery (conventional steam plant including turbo-generator)		.078
3. Nuclear hazard including radioactive contamination		.30
(*a*) Reactor type	$0.175	
(*b*) Use	—	
(*c*) Power level	.075	
(*d*) Containment	.05	
	.30	
4. All-risk overlay for perils not included above		.02
Composite rate per $100 insurance		.488

With an assumed 90 percent insurable value of $30 million the annual cost for all-risk property damage coverage at $0.488 per $100 of insurance would be $146,400.

Assuming a gross electric generating capacity of 134,000 kilowatts and an operating factor of 60 percent, this annual premium of $146,400 would result in a per kilowatt-hour cost of approximately two-tenths of a mill (0.208 mill). Assuming an operating factor of 80 percent, the kilowatt-hour cost would be approximately sixteen hundredths of a mill (0.16 mill).

In each of the above examples, the estimated composite rate per $100 of insurance and the approximate cost per kilowatt-hour have been developed from tentative or preliminary information as to the construction of the reactor building or enclosure, the boiler and machinery exposures, the characteristics of the reactor per se and most important, the actual insurable value of the installation upon completion. With the many variables, all subject to further change as each installation progresses, it must be realized that the rates, premiums, and cost per kilowatt-hour as noted herein reflect our best judgment and can only be construed as estimates or approximations within reasonable limits at this time.

Mr. Black will comment in this report in behalf of the insurance industry with regard to the AEC proposed amendments to S. 715.

Respectfully submitted.

WILLIAM H. BERRY,
Vice President, America Fire Insurance Group,
Chairman, Executive Committee, Nuclear Insurance Rating Bureau.

The CHAIRMAN. How do your rates compare with something like chemical plants, or can you give us some comparison?

Mr. BERRY. I could not give you a true comparison unless I had a good chemical plant to compare with specifically.

I will say this: First of all, as Mr. Black has already indicated, our policy will be an all-risk in nature, with certain basic exclusions.

The CHAIRMAN. What I was trying to get was just a common ordinary risk, like a steam plant.

Mr. BERRY. Our rates on these nuclear plants will be much higher than the conventional steam plant. However, we will start out in each and every case on the powerplants with the basic fire rate that they are paying at the present time, adding what we call the extended coverage rate; then the basic vandalism and malicious mischief rate, the basic sprinkler leakage rate if there is sprinkler leakage exposure; and to that we will add the conventionel charge for boiler and machinery and in addition the nuclear perils.

Representative COLE. Why would your rates be greater than the usual fire rate?

Mr. BERRY. We feel that the nuclear hazard is certainly a recognizable one and presents a much greater potential than does the average fire.

Representative COLE. Your risk is determinable.

Mr. BERRY. That is correct.

Representative COLE. The public liability is an indeterminable risk.

Mr. BERRY. That is right.

Representative COLE. For that same reason your risk in fire protection is likewise determinable. For the moment, at least, I do not see a clear justification for any considerable need of plant protection for nuclear fuel than conventional.

Mr. BLACK. Perhaps I can help you with that, Mr. Cole. Under the normal fire policy the building must be consumed to have a total loss, or most of it consumed by fire. But with this instrument we are dealing with here, you can release material through an incident where it would contaminate the building to the point where the building would stand there for all intents and purposes as good as the day it was built, but yet you could not go near it and there would be a total loss and there would be no fire. That is an entirely different hazard than we have had to deal with under our pure fire business.

Representative COLE. I do not see in what respect. With respect to fire you anticipate the possibility of total loss. You expect the same possibility with nuclear fuel.

Mr. BLACK. We also have the fire hazard, too. That is still there. But you have added another.

The CHAIRMAN. Mr. Black, have you looked over the changes in the bill?

Mr. BLACK. I have not, sir.

The CHAIRMAN. I do not believe you stated whether or not you were for the measure as it is now written.

Mr. BLACK. I indicated that I was for the Senate 715, sir. But I have not looked at the amendments. We will file a memorandum on that (see letter, p. 131.)

Representative COLE. This bill does not affect or interest you at all, does it?

Mr. BLACK. It interests us to the point where we would like to insure the properties that are being used.

Representative COLE. I was just handed a memorandum by somebody that said that this bill does not affect the kind of insurance operation you are talking about.

Mr. BLACK. It allows us to insure the business.

Representative COLE. You can do that without this bill.

Mr. BLACK. Yes.

Representative COLE. Of course, Mr. Haugh's group could, too.

Mr. BLACK. Yes.

Mr. RAMEY. I think the question would be that since your insurance covers the reactor operator for his property losses, this bill which is an idemnity bill against third-party liability would not cover any excess over the reactor's property losses?

Mr. BLACK. Yes; that is correct.

Mr. RAMEY. I take it your intent is to cover entirely the operator's property losses?

Mr. BLACK. That is correct.

Representative COLE. If there is a property loss in excess of the amount for which it is insured, can the owner under this bill look to the Federal Government for payment?

Mr. BLACK. Not to my knowledge, sir.

Representative COLE. Then the net purpose and need for legislation of this type of bill, as I see it, is substantially only to commit the Government to the damage in excess of the amount of the public liability insurance.

Mr. BLACK. That would be my interpretation.

Representative COLE. That is really the heart of the bill.

Mr. BLACK. That is right.

Representative COLE. What else is in there than cannot be done now since this syndicate has been created and you are ready to go ahead with it?

(No response.)

The CHAIRMAN. Mr. Jenkins?

Mr. JENKINS. I have no questions.

The CHAIRMAN. Mr. Van Zandt.

Mr. VAN ZANDT. I have no questions.

The CHAIRMAN. Thank you very much.

Mr. BLACK. Thank you very much, sir.

The CHAIRMAN. Our next witness will be Mr. McCune. We are very glad to have you with us this afternoon.

STATEMENT OF FRANCIS K. McCUNE, VICE PRESIDENT, GENERAL ELECTRIC CO., ACCOMPANIED BY WILLIAM KENNEDY, COUNSEL OF THE ATOMIC PRODUCTS DIVISION, GENERAL ELECTRIC CO.

Mr. MCCUNE. Thank you, sir.

The CHAIRMAN. Do you have a statement?

Mr. MCCUNE. I have a statement which I would like to read if I may.

My name is Francis K. McCune, and I have with me Mr. William Kennedy, who is counsel of the General Electric Co.'s atomic products division.

I would like to say to begin with, Mr. Chairman, that your letter asked that our testimony be limited to any changes in the proposed legislation that we might feel to be necessary. I want to make it plain to begin with that I am down here to testify for the legislation and not against it, regardless of your introduction, if I may.

The CHAIRMAN. Very well, sir. I believe you appeared last year and were for the measure then. The only reason we are raising a question on the amendments is whether or not there is any agreement on them.

Mr. MCCUNE. I want to be quite clear that I am testifying for the legislation.

Representative COLE. In your statement do you intend to discuss the changes which have been proposed by the Commission?

Mr. MCCUNE. As far as the changes proposed by the Commission are concerned, I received those from your Executive Director on Monday. I was traveling on Monday. I have spent most of this morning going over those.

I think the only thing that I can say is, that having studied them that long with my counsel, has not caused me to change my testimony.

The CHAIRMAN. Unfortunately, the amendments were not submitted to the committee until Saturday morning.

Mr. MCCUNE I understand.

The CHAIRMAN. I apologize for the Commission and not for the committee on that.

Mr. MCCUNE. Frankly, as I say, with the study that I have put in on them, which is a certain amount of study, I still see no reason to change this testimony.

Representative COLE. As of now, is it your opinion that the changes proposed by the Commission are acceptable?

Mr. MCCUNE To make a detailed statement, there are a large number of changes. Frankly, some of them, I think, are pure detail which there is no need of changing. There are 1 or 2 points. Initially I thought that on the part which had to do with workmen's compensation—I am not an expert on that—they might well be right. On further study we thought they were wrong in what they said and the bill was right as it stands.

There is at least one instance in which my reading and the readings of others of the bill would seem to be quite at variance with their reading of this bill. But the net of it is that I do not think the bill requires those specific amendments.

Representative COLE. Any of them?

Mr. MCCUNE. I do not think it requires them. If the bill were thrown open, I think any of us who testified here could think of something they would like added on. Frankly, I think we need the bill, and I do not think anything that is there is of sufficient importance to require that the whole subject be brought open again.

The CHAIRMAN. Since you have not had time to study them in detail, Mr. McCune, if you care to, you can submit a statement on them as soon as you have it prepared.

Mr. McCune. I will be glad to do that (see p. 157). I just wanted to tell you that we spent some time looking at it and I do not feel it changes my position on the bill.

Representative Van Zandt. Mr. McCune, do you think it is so imperative that we enact legislation in this field that you are willing to accept the bill as originally written to save time?

Mr. McCune. Yes. I do believe, as I will point out in my testimony—and maybe I should get ahead with that—that there are some areas which well could be clarified in the report which accompanies the bill, if you saw fit to do so and if I understand your intent as you understand it.

But that is about the maximum which needs to be done.

Shall I go ahead with the statement?

The Chairman. You may proceed.

Mr. McCune. This year, as in all the preceding years, the theme of your hearing is: How can we best make progress in the development of the atom? All of us, I believe, view the liability problem in that context. The objectives are to encourage industry to play its full and proper role in harnessing the atom to our needs and, at the same time, to protect the public.

At the last session, the Joint Committee reported favorably legislation which would accomplish these purposes. At this session, Senator Anderson and Congressman Price have again introduced bills along the same lines (S. 715 and H. R. 1981). As you know, I testified in support of the Joint Committee legislation a year ago. I am in favor of the similar bills introduced this year.

In previous hearings the Joint Committee has had the benefit of testimony from many witnesses representing all interested points of view. The final Columbia report, prepared under the auspices of the Atomic Industrial Forum, was published in January. All of us are much indebted to the authors of that report for their thoughtful and lucid analysis of the policy and legal issues. Finally, the members of the committee and of its staff have done an excellent job of studying the problem and of formulating a practical legislative solution.

My own views are well known to you. I have discussed the liability question in testimony before this committee on a number of occasions, beginning in 1954. There is very little, therefore, that I can add to what has been said before. Certainly, there is not anything I can say which will add to the committee's understanding of the basic questions or of their importance. However, I would like to touch on several matters which seem to me significant.

In doing so I would like to discuss separately the three areas where this issue is of crucial importance: These are the civilian power program, the defense program, and the program to encourage participation by United States industry in the international atomic market.

I. CIVILIAN POWER PROGRAM

NEED FOR LEGISLATION

By now, the need for legislation is generally recognized. It has the support not only of the members of this committee, but of the President and the Commission and I believe of almost every group in any way connected with atomic activities.

The case for legislation is perhaps best and most forcefully stated in the Columbia report. As I see it, the simple and generally accepted premises are these:

(1) The hazards are almost, but not quite, impossible. Certainly all the operational and experimental data indicate that there is no likelihood of a disaster. However, conjecture and calculation have resulted in general acceptance of the view that there is an extremely small chance of a very large catastrophe.

(2) There is a need to provide to the public financial protection against such a catastrophe.

(3) In order to encourage private participation in atomic development, it is necessary for the Government to provide to the reactor operator, suppliers, and others, protection against liability which cannot be covered by reasonably available private insurance.

The case for liability legislation is independent of other issues relating to acceleration of the civilian power program. Those who advocate a program of Government financing for construction of nuclear powerplants have stated that they do not regard such a program as displacing private efforts but only as supplementing them. Regardless of whether steps are to be taken by Government to accelerate atomic development, it is still desirable to do everything reasonable to clear away obstacles to privately financed projects. Moreover, a Government program such as is contemplated by some of the bills now before you won't be feasible unless the liability issue is resolved. This is because the liability question is essentially the same regardless of who finances the project.

GENERAL ELECTRIC'S POSITION

In testifying on this subject in the past 3 years, I have said, in effect, that failure to provide liability protection could constitute a major obstacle to private work in the atomic field. I have expressed concern that some projects might be delayed or halted if legislation were not enacted. In this connection, I believe all of you are aware that in a recent poll conducted by the Atomic Industrial Forum, the unresolved liability question was rated second only to the lack of economic incentives as a roadblock to further progress.

On the other hand, General Electric Co. has not delayed or halted its own work. To the contrary, it has gone ahead in the full confidence that legislation will be passed.

There are two reasons for this confidence:

First, we believe that the case for legislation is clear and overwhelming.

Second, it has been our experience that the Congress, acting on the advice of this committee, has always been prepared to do what is essential to atomic progress. I believe that others have been going forward with the same conviction.

I will not go into detail here about the status of our work on the Dresden Station project for Commonwealth Edison and the Nuclear Power Group. Nor will I describe in detail our expenditures for development and for facilities, particularly our Vallecitos Atomic Laboratory, and our plans for investment in additional facilities. However, some of you here have visited our sites at San Jose, Calif., and at nearby Vallecitos. You know that what I am talking about is not a matter of press releases or announcements but, on the contrary,

of facilities under construction or actually in place, engineering and scientific people on the job, work going on, money being spent.

Let me emphasize the words "money being spent", because that is the best index of what we have done. To date we have spent over $21 million by way of investment and of related expense including development. In addition, we have spent to date on the Dresden station project over $6 million, and by midsummer we will have spent on this project about $12.5 million. In the event of termination of the Commonwealth Edison contract, half of this $12.5 million would be borne by Commonwealth Edison and its associates in the nuclear power group and half will be borne by General Electric.

In short, General Electric has already incurred for its own account, expenditures of over $24 million. At midsummer, expenditures incurred for our own account will be over $33 million. These figures do not include any estimated costs of cancelling commitments.

However, the Commonwealth Edison contract contains a clause to which Mr. Willis Gale, chairman of Commonwealth Edison, referred in his testimony of February 16, 1956. This clause provides that either party may terminate the contract in December 1957 if satisfactory liability protection is not then available. Hence, we have had to consider most carefully what we would do if adequate legislation were not enacted at this session.

I think it only fair that I give this committee a statement of our thinking.

We have been very reluctant, categorically, to state that we will not proceed unless an indemnity bill is passed by Congress. We have feared that such a statement might be misinterpreted as a threat to Congress to take action "or else". Further, we have not wanted to cast any doubt on the ability of private industry to carry a major share of the job of atomic power development. Eventually, however, there comes a time for a frank statement of the position of the General Electric Co. I am sure that the committee would want us to make such a statement and would not misinterpret our motives in doing so. The effort we have put into the atomic power program and the money we have spent on it should be sufficient evidence of our good faith. At present I see no alternative but to recommend that work on the Dresden station be halted as soon as practicable after the end of this session of Congress in case appropriate legislation has not been passed by that time. Also, as I now see it, it is my view that General Electric should not take on any other comparable project if it appears that appropriate legislation will not be passed. I believe you appreciate that I have arrived at this view only with the greatest reluctance.

RELATION BETWEEN INSURANCE AND INDEMNITY

The Anderson-Price bills contemplate, as they should, an important role for private interests in providing financial protection against atomic hazards. The licensee must prove financial capacity to satisfy claims arising out of a nuclear incident in an amount determined by the Commission. Financial protection may be provided by private insurance or other means. The Government indemnity is intended to cover only that liability not covered by private insurance or its equivalent.

It has always been obvious, therefore, that the amount, the cost and the terms of private liability insurance would be of considerable importance. We now have information as to the amount of liability coverage which will be available from the two syndicates, some informal indications as to rates, and a draft of policy.

The companies comprising these two syndicates have worked hard to assemble coverage, to develop rates, and to frame policy terms. I assume that witnesses representing the insurance industry have given you their story in detail.

We have examined the draft of a liability policy. The full implications of this policy are still not clear because we have not yet been given a draft of the related property damage policy.

I might interpolate to say that at present for our Vallecitos laboratory we have under binder a $5 million insurance policy. We have an estimate of cost, we don't have a policy.

We also have a binder of $8 million property damage. There we have not settled on the premium nor are we sure of the policy. But we have taken action to obtain insurance. The insurance companies have been willing to execute binders.

However, we have found that the liability policy contains a number of limitations. As to these limitations, I hope that there will be room for negotiation between the syndicates and the atomic industry. In any event, it does not seem necessary to go into them in detail.

For purposes of the liability legislation, however, it is important that the Joint Committee understand that a $50 million policy may not mean that there will be $50 million available to pay all legal liability arising out of a nuclear incident. The face amount of the policy will not be the amount available to pay claims but rather the amount of the insurers' total obligation under the policy for all purposes—not just for payment of claims but for legal, investigation and other expenses. Moreover, certain types of liability may not be covered by the policies as finally agreed upon.

It has, I believe, always been the intention of the joint committee that subject only to the qualifications explicitly provided in the bill, all legal liability arising out of a nuclear incident would be covered by private financial protection or Government indemnity or both. It is important, therefore, that the committee make plain its intention, by way of its report on the bill or otherwise, that there be no gaps in coverage. Specifically, it should be made clear that the Government indemnity is intended to cover any legal liability arising out of a nuclear incident, not expressly excepted by the bills and not covered by the required financial protection. Anything less than this may mean that the public and the participants in a nuclear project will be denied the protection which the committee means to provide.

II. GOVERNMENT CONTRACT WORK

In my testimony of March 1956, I pointed out that from the point of view of the public, of the Government and of the private companies performing the work, the problem of financial protection against atomic hazards was essentially the same regardless of whether a project was Government-financed or privately financed. The Anderson-Price bills recognize this fact. They cover essentially four kinds of situations:

1. Privately financed work subject to the licensing provisions of the 1954 act;
2. Contract work financed entirely by the Commission;
3. Contract work where the project is financed in part by the Commission;
4. Work for another agency of the Government where that agency is required to obtain a license under the 1954 act.

DEFENSE DEPARTMENT WORK

It had been our view that this latter category included not only work for agencies such as the Maritime Administration, but also some Defense Department work. This is because the 1954 act may be construed as requiring licensing of at least some Defense Department activities. However, the report on the Joint Committee legislation last year indicated an intention to exclude from the scope of the bill Defense Department work, except in the case of joint AEC-Defense projects.

I understand that the Defense Department has been preparing legislation to deal with financial protection against atomic hazards as a facet of a general problem. Congress will have to decide whether it is better to treat the Defense Department atomic liability problem in the Anderson-Price bills or in separate legislation. Certainly, I would be disturbed if the Anderson-Price bills were delayed by consideration of the Defense Department situation. However, I believe it important that this committee understand that there is a problem of growing seriousness on the Defense side.

The policy considerations in favor of providing protection with respect to work under Commission contracts apply equally to work under Defense Department contracts. Moreover, as the Defense Department applications grow, and they are growing fast, the problem will become more acute. If an incident were to occur in a case where no Government indemnity was available, a private firm, perhaps a relatively small supplier, might be ruined and the public left unprotected.

The present practice of both the Commission and Defense Department is to provide protection in some cases and in varying degrees to prime contractors and major subcontractors. Generally, no protection is afforded to the many suppliers of a project. As the Columbia report points out, this is a practice which requires reexamination. The public should have the benefit of a Government indemnity no matter who is legally liable for an incident. Private companies contributing to a nuclear project should be protected on a uniform basis, regardless of whether they are prime contractors or subcontractors, large companies or small, and regardless of whether they operate facilities, design and assemble reactors, supply fuel, or do other work such as supplying components.

COMMISSION WORK

As to Commission work, the idemnity authority of the Commission will, if these bills are passed, be found in the liability legislation and in other provisions of law. Regardless of the legal source of the Commission's power to indemnify, I hope that this authority will

be administered liberally equitably and on as uniform a basis as possible in order to effectuate the congressional purpose of providing protection against catastrophic loss both to the general public and to persons who may incure a liability.

III. INTERNATIONAL LIABILITY

In my March 1956 testimony, I urged that a study be made of the international liability problem. I have reiterated that suggestion this year in my February 20 letter to Chairman Durham.

I want to emphasize that I do not think the international problem can be dealt with in the Anderson-Price bills. However, I believe that the committee recognizes that the question of liability in foreign transactions is both serious and urgent. Moreover, I believe that there is growing concern about the issue not only on the part of American industry but also in Europe.

There is a variety of views as to the direction this country's atomic program should take. However, one proposition on which I believe almost everyone is now agreed is that it is desirable for American industry to play a significant role in aiding atomic development in friendly foreign countries. We had better face now the fact that the liability issue may constitute here the same kind of obstacle that it constitutes on the domestic side.

In my judgment it is a mistake to suppose that this obstacle can be eliminated in individual contract negotiations of American firms. Rather, it requires action on the Governmental level. We must have a policy which will not put American industry at a disadvantage with respect to foreign competitors. We should not by inaction run the risk of leaving the market totally to them.

One way of dealing with the question is by bilateral agreements under which liability protection would be provided by the Government of the foreign country concerned. If legislation along the lines of the Anderson-Price bills is passed, foreign suppliers of reactor projects in this country will be protected. In that event, we will have a strong argument for reciprocal treatment of American suppliers by foreign governments.

Another approach is that of the multilateral agreement, an international convention. As you know, there is such an agreement, the Warsaw Convention, which governs liability arising out of international air transportation. Although I believe atomic liability problems will require treatment different from that provided in the Warsaw Convention, a multilateral agreement of some type may be the best long term solution. However, even if this is the case, the bilateral approach may be the best interim technique until a convention can be prepared and negotiated.

In any event, I hope that the Joint Committee and its staff will begin an intensive examination of the problem. It would also be desirable if the Joint Committee would encourage and keep in touch with work in this area by others—whether they be in the Commission or the State Department or in private pursuits.

I said at the outset that I believed all of us viewed the liability question as just one more problem to be solved in order to promote atomic development. Certainly that is the way it should be viewed. It is understandable that on other matters there should be different

views as to how best to get on with the job that all of us agree must be done. But the fact that we have general agreement on this question is not, to my mind, accidental. Whatever other specific steps may be taken or not taken to advance the development of the atom, it is still true that a solution of the liability problem will materially further our progress, and that without such a solution we may ultimately find ourselves on dead center.

I am confident that on this, as on other matters, the Joint Committee will provide the leadership that is required.

The CHAIRMAN. Thank you very much, Mr. McCune, for your very frank statement.

In regard to the matter of foreign insurance, on March 7, I wrote the Chairman of the Commission, Mr. Strauss, this letter, which I would like to place in the record at this point, and I will read it.

The Joint Committee on Atomic Energy anticipates having hearings sometime in the latter part of March—at a date to be definitely set in the future—on S. 715 and H. R. 1981, introduced by Senator Anderson and Mr. Price, respectively, relating to indemnities for the atomic-energy program

One aspect of the situation which has not been adequately covered is the question of how to treat nuclear hazards which occur in other countries. At a meeting of the Atomic Industrial Forum, held in New York on January 22, Mr. Stoddard Stevens suggested an international convention to be held to resolve the problem on that scale. I would think it worth considering that such an international solution could incorporate an international pool to be available above and beyond the amounts of private insurance which would be available—in other words, a system of international relief similar to the Anderson and Price bills. Each nation could be asked to contribute to the pool. The difficult substantive and procedural problems involved in an international incident could also be covered by such a convention.

Another possible solution would be for each government to arrange for indemnities under its bilateral agreements, as suggested by several committee members.

The Joint Committee would appreciate hearing from you at the time of the hearings on this problem as to the desirability of any action that you might believe desirable, such as the above proposals, including new legislative proposals.

I suppose you read the Chairman's testimony yesterday on that point?

Mr. MCCUNE. Yes, I did.

The CHAIRMAN. Which appears to me to be a little bit cool as to approaching this problem. Do you have any opinions or would you care to give us your opinion?

Mr. MCCUNE. As I recall it, and I just checked with Mr. Kennedy, that testimony was confined, I think, exclusively to the international convention approach.

The CHAIRMAN. That is correct.

Mr. MCCUNE. I have had in mind that was the right way to treat this extremely complex problem.

The CHAIRMAN. I believe he said in his statement that the bilateral would not work.

Mr. MCCUNE. His recommendation was the international convention.

The CHAIRMAN. I will read what he said yesterday:

The committee also noted that another possible solution would be to arrange for indemnity through our bilateral agreements for cooperation. On the basis of our study thus far the Commission has reservations regarding the desirability of this approach. It would require the cooperating country as a condition to receiving the benefits offered by atoms-for-peace program to undertake the

indemnification of private American capital. Rather than encouraging the sale of American reactors abroad, such a procedure might have the reverse effect.

That is what threw this doubt into my mind as to whether or not it would work. He goes on further:

We are continuing to study this suggestion, however.

We realize, of course, it is a problem. It is one that is not so easy to work out. If we can get the countries, as you suggested, to adopt such a bill as we are trying to adopt here it would solve the problem very easily, I think.

Mr. McCUNE. I have looked at it this way. There is consistent information to the effect that our major international competitor, Great Britain, has solved this problem by their Government accepting the liability risk.

Representative COLE. What evidence have you of that?

Mr. McCUNE. I was just going on to say that I have tried to check this. I have absolutely no evidence that this is actually the case. There are no published reports that I know of and no specific negotiations, so I do not know whether or not that is correct. That would be the case and the only case, as I see it, against the bilateral agreement. As I pointed out in my testimony, we have said that a reactor supplier responsible for a portion of an American unit is given protection. I think, therefore, we would have some right to ask that they extend the equivalent kind of protection in their country.

I believe, and I have believed for some time, that the international convention was a preferred solution. I do not want to be critical. I must point out that the present act was passed in 1954 and, if my memory is correct, there are only three power bilaterals executed—and I believe there are a number lying before your committee now. And it is 3 years, roughly. My guess is that an international convention might take much the same length of time.

I am not experienced. I don't know. I just don't think we can wait that long. If the decision were that an international convention could be arrived at in a matter of a few months, now that the EURATOM treaty is signed, then I think that is the preferred solution.

But if the judgment would be that it would take as long to do that as it has taken to work out bilateral power agreements—it has taken a long time with a lot of work—then I think we must have a stopgap solution or take a great deal of delay.

That is the best answer I can give you, sir.

The CHAIRMAN. What is your suggestion for a stopgap solution?

Mr. McCUNE. The suggestion is that for the time being we put in the bilateral agreements that the foreign governments will undertake the protection to the American concerns who contribute to the foreign project, as has been suggested by some members of your committee.

The CHAIRMAN. You believe that would be the fastest way to proceed?

Mr. McCUNE. I would think so.

The CHAIRMAN. Instead of through the international convention?

Mr. McCUNE. It must be clear to you that this is a matter on which I should think the committee would want the advice of the Com-

mission, and maybe the Department of State, as to the length of time it would actually take, working either through a large nucleus, such as the United Nations, or possibly a selected group of countries who are really ready to go ahead—a much smaller group.

Representative COLE. At that point I was going to ask your opinion. I think everybody has agreed that the international compact route is the most desirable, but at the same time we recognize that it is a time-consuming route and the program will not permit that delay.

I am wondering if you think it would be necessary to organize an international conference for this specific purpose rather than to use the international agency for this purpose. I am assuming that the international agency will come into being eventually, perhaps within another year, and if so, why is that not the proper international agency to deal with this problem of liability in the atomic field? If it is a logical organization to deal with it, since it is in being, it would save a great deal of time.

Mr. MCCUNE. The only answer I can possibly give to that is that I have no way of gaging the rapidity with which such an international agency can really move, nor how effectively it would be established to make such motion. I would consider myself totally incapable of estimating that. But I would like to point out that it has taken, as I said—and this is not critical—3 years, as I see it, or a little more perhaps, to study the liability problem in this country. My guess would be that in France or Italy or Belgium, where the situation may be much the same, it may also take quite a period of time to study the problem and arrive at an insurance pattern, an industrial pattern, a governmental pattern. I think we need to break the logjam by some specific action, even if on a temporary basis.

I would hope that the Anderson-Price bills that we are discussing could be kept for the domestic scene and that we take this on as another problem.

The CHAIRMAN. I think it is a proper agency if it is once set up and accepted by the Congress. I can see, as you do, that these agreements would necessarily have to be referred back to the legislative bodies and rehashed somewhat, as we have been doing here for quite a period.

Mr. MCCUNE. I think so. They in turn would have to call in their industrial people and their insurance people and set up groups to study the problem. I can see quite a bit of machinery that would have to be unrolled.

Representative COLE. Do you share the Commission's viewpoint with respect to the international agreement for cooperation method for dealing with this indemnity abroad? Do you share their apprehension that it would tend to stifle competition rather than to enlarge it?

Mr. MCCUNE. Did I understand you correctly? I thought the Commission thought that the bilateral power agreement approach might stifle competition rather than the international agreement.

Representative COLE. That is what I meant when I said the agreement for cooperation.

Mr. MCCUNE. The bilateral?

Representative COLE. Yes; the bilateral.

Mr. McCUNE. As I told you, I think there is a chance that there is some danger. Specifically, if by law this country becomes bound so that its course is fixed, that allows any other country to say, if they have more incentive to meet the international market, we will in effect give you just a little better deal because we will give you the liability without any specific agreement. Frankly, as I see it, we will forgo the market almost entirely and forgo the development unless we produce a reasonably quick solution. The only reasonably quick solution—and I have told you my rather defective judgment as to timing—is through the bilateral route.

Representative COLE. But in the absence of clear and positive undertaking by a government supplying the reactor material, do you see any competitive disadvantage in the power bilateral method?

Mr. McCUNE. No.

Representative COLE. Are you sufficiently familiar with the rates which have been proposed by Mr. Haugh's group to give an expression of the reasonableness of them? That is, whether they are realistic or not?

I have found that your experience and your knowledge in the atomic field has been very, very helpful to me, at least, and I am sure to other members of the committee. I have great respect for your judgment and opinion, and I would like to have your viewpoint as to whether you feel that these proposed rates, as they now appear likely to be, are reasonable.

Mr. McCUNE. Let me say first that anything I can say is only a conjecture. As far as the insurance on a large station is concerned, we are involved in the Dresden project. The principal burden of that insurance will fall on the Commonwealth Edison Co. I believe they are presenting testimony and will comment on what they think the rate structure would be.

Our experience, as I said, is that we have applied for liability insurance and we have applied for property insurance for our Vallecitos site. That site is just beginning to come into a situation where it has fissionable material. We have coverage. Insurance companies have given us coverage as of last week, or something like that. But we have not yet a final rate or a final policy. We have an estimated premium rate on the third-party liability. I do not believe we have an estimated rate yet on the property. I believe both are subject, as they should be, to an inspection of the property by the insurance representatives.

Representative COLE. Perhaps it is unfair for me to ask you to comment. My reason was, since your own rate is in a stage of negotiation, I had hoped you might be able to say that the rates as you now see them to be are fair. But if you do say that, then you lose your discussion situation with the insurance people. I believe I better not ask you.

That is all the questions I have.

The CHAIRMAN. Mr. Jenkins.

Representative JENKINS. I have no questions.

The CHAIRMAN. Mr. Van Zandt.

Representative VAN ZANDT. Mr. McCune, I am greatly impressed by the sincerity of your statement on page 5 where you state that we

will not proceed unless the indemnity bill is passed by Congress. Then you proceed to say, at the bottom of the page:

> At present I see no alternative but to recommend that work on the Dresden station be halted as soon as practicable after the end of this session of Congress in case appropriate legislation has not been passed by that time.

Am I right in concluding that in planning the Dresden station you anticipated that Congress would take action in the indemnity insurance field? Is that right?

Mr. McCUNE. That is right.

Representative VAN ZANDT. Has this planning entered into any other contract in which your firm is interested?

Mr. McCUNE. Yes.

Representative VAN ZANDT. Is it written into a contract?

Mr. McCUNE. Let me see, because I will have to be specific. We have a large number of contracts. Any contract, large or small, which we have entered into—and I think I can say this without question—a contract for Hanford or something of that type which I am sure is a different matter, we have taken the stand that the work would have to stop at some time if adequate liability protection could not be obtained—usually adequate for both parties. This involves a settlement of the insurance situation as well as covering liability. I think that this is quite representative of all industry.

Representative VAN ZANDT. What position will the General Electric Co. find itself in in the event that no indemnity insurance is provided for by this Congress? Is it not true that you are going to find yourself in a very difficult position?

Mr. McCUNE. That is correct.

Representative VAN ZANDT. In addition, it may prove very costly.

Mr. McCUNE. That is what I tried to point out.

Representative VAN ZANDT. I do not feel the position you are taking today is a threat. It is an honest statement coming from a spokesman of a great corporation. We have to recognize the seriousness of it.

Is it safe for me to assume that your statement would have the support of industry in general in this country—who are participating or who are to become involved in this field of nuclear development?

Mr. McCUNE. You would have to judge that; not I. I don't see how anyone looking this problem square in the face at the time they are spending money as rapidly as we are on a concrete project could arrive at any other conclusion. As I pointed out, we have a contract; we have two parties to the contract. Nevertheless, this is what I would have to do, as I see it.

Representative VAN ZANDT. In the event Congress fails to enact the indemnity insurance act, does it mean that the General Electric Corp. would practically withdraw from the entire nuclear field?

Mr. McCUNE. You are asking for a large commitment, but I would say this: I do not believe that there can be a domestic industry without the settlement of this problem. Let me put it this way.

One of the members of your committee, I think, put it very well last year, when he said he would not allow one of these things in his State if he were again a governor—if I recall the statement, or something of that kind—unless there was protection available. I don't believe there will be any market for the civilian products of atomic

energy unless the liability problem is solved. If there is to be a market, I think a man is foolish to continue investing to meet a market which will not exist.

That is the whole problem in a nutshell. I think there has to be a market. I don't think the public will stand as they get more information—either the public in terms of business or all types of business or the public who have no connection with the project--for the creation of a market if this problem cannot be solved. Since I see no way of solving it except by congressional action, then I arrive at the conclusion that congressional action is necessary.

Representative VAN ZANDT. In other words, this committee has the ball and we have to carry it.

Mr. MCCUNE. You said that.

Representative VAN ZANDT. Thank you.

Representative COLE. You don't dispute it, do you?

Mr. MCCUNE. No, sir. I think it is a very heavy responsibility. This is just really the nub of the whole problem.

Representative PRICE. Mr. Chairman, I want to compliment Mr. McCune upon a strong, frank, and honest statement of the position that he, representing one of the major contributing companies in this program, finds himself in. I think he very forcefully indicates that if we are to have a power reactor development program, with private industry participating, Congress must provide an indemnity program. I think that we have about reached an impasse and an obstacle that we cannot overcome without favorable congressional action on this legislation.

The CHAIRMAN. Thank you very much, Mr. McCune. You always give us a good statement and we appreciate your being frank. I, for one, believe that it is necessary that we adopt this measure in order to get along with this job. I have felt that way for some time.

Mr. MCCUNE. Thank you very much.

(Mr. McCune's comments on proposed amendments to S. 715 and H. R. 1981 referred to on p. 146 and his comments on S. 1684 follow:)

GENERAL ELECTRIC CO.,
ATOMIC PRODUCTS DIVISION,
Schenectady, N. Y., April 12, 1957.

Hon. CARL T. DURHAM,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States, Washington, D. C.

DEAR CHAIRMAN DURHAM: In the course of my testimony on liability legislation you requested my comments on the amendments to S. 715 and H. R. 1981, proposed by the Atomic Energy Commission. These amendments raise questions both of policy and of law and it has not proved practical to separate them for purposes of discussion. The attached memorandum, prepared with the help of counsel, deals with policy and legal issues.

With the exception of the change suggested with respect to licensed activities for the account of other Government agencies (which seems to me undesirable) and one or two other matters, the general intent of the Commission amendments appears to be to broaden the protection afforded by the bills to the public and to industry. Accordingly, although we have differed with some of the specific suggestions made by the Commission, I believe that its basic approach is to be commended.

My general views as to the importance and urgency of this legislation and the fundamental soundness of S. 715 and H. R. 1981 have been made clear in my March 26 testimony.

Sincerely yours,

F. K. MCCUNE,
Vice President.

AMENDMENTS TO S. 715 AND H. R. 1981, PROPOSED BY THE ATOMIC ENERGY COMMISSION

COMMENTS OF GENERAL ELECTRIC CO.

1. A number of the Commission's proposed amendments to S. 715 and H. R. 1981 are designed to refine the language, or to deal more explicitly with certain points, or to make administrative changes or minor alterations. The proposed amendments of sections 2 (i), 53 (e) (8), 170f, 170g, 170i, and 170j, and three of the changes in section 170a (express exclusion of export licenses, express provision for maintenance of financial protection, and the express provision that the indemnity shall run from the Commission to the licensee), fall into one or more of these categories and seem acceptable.

Other changes (in sec. 170c and d) would provide that the indemnity authority apply for a full 10-year period. A year has passed since the original introduction of the bills, and this change seems appropriate. Again, that portion of proposed section 11*l* which would provide that costs of investigation, defense and settlement of claims would be covered by indemnity seems desirable, although this provision would probably require clarification of the limit of liability language in section 170e (see discussion under 6 below).

2. The Commission would exclude from the scope of section 170a and c cases where the licensed activity is for the account of another Government agency. Section 170c of the bills makes the obvious point that the indemnity would not run to another Government agency. However, the bills have generally been construed as providing that all other persons who might be subject to liability arising out of or connected with a licensed activity for the account of a Government agency would be covered by Government indemnity (Joint Committee report on S. 4112, p. 12; Columbia report, p. 53, fn. 319).

The arguments of policy in favor of covering Government-financed as well as privately financed activities are made most cogently in the Columbia report (pp. 53–54). The need of the public for protection is essentially the same in both cases. Facilities operators, suppliers, and others also need protection. Separate legislation to cover each agency means at best long delays in solving the problems. We hope that the Joint Committee will provide in this legislation the protection required.

3. The Commission amendments, as we read them, make essentially the following changes in section 170a with respect to the kinds of licensed activities to be covered by the bill:

(i) They remove the discretion granted to the Commission with respect to licenses for source or byproduct material.

(ii) They make financial protection and indemnity mandatory with respect to certain cases where licenses are granted with respect to special nuclear material.

The change referred to in (i) seems undesirable. It is not now possible to foresee all the risks which may arise with respect to byproduct material particularly, nor is it possible to say with assurance that available insurance coverage with respect to those risks will be adequate. Granting discretion to the Commission certainly does not harm and may, in the light of subsequent developments, prove quite helpful. As to the cases involving special nuclear material licenses dealt with in the amendments, it would seem reasonable to expect that the Commission, under the bills as introduced, would exercise its discretion to require financial protection and grant indemnity.

Accordingly, it would seem that in this area, the bills as introduced are satisfactory.

4. The Commission has urged that its indemnity authority in the contract program be coextensive with its authority in the licensing program. The Columbia report takes essentially the same position (pp. 53–54). We believe that section 170d ought to apply at least to those activities which are covered in section 170c. An amendment along the lines suggested in the testimony on behalf of the New York City Bar Association (Tr. 211) which would give protection to the public and industry in all cases where there was a risk of a substantial nuclear incident would seem desirable.

5. Some liability of reactor operators, suppliers and others connected with a project may not be covered by the insurance syndicates' liability policy, and the amount available to pay claims will be uncertain because the face amount of the policy includes the obligation of insurers to pay investigation, litigation and

other expenses. We believe that the more reasonable interpretation of S. 715 and H. R. 1981 in their present form is that (i) they do not contemplate that the financial protection required will exceed either in amount or scope of coverage the available insurance, and that (ii) the Government indemnity is intended to apply to all public liability (as defined in the bill) which is not covered by the required financial protection, so that the public and industry will be afforded full protection. As we see it, the basic purpose of one set of Commission amendments (sec. 11j, proposed sec. 11p, the proposed new last sentence of sec. 170b, sec. 170c, and sec. 170d) is to make these conclusions clearer and more explicit. This purpose is a sound one.

We had hoped that the committee's intent could be clarified. If the committee believes that amendments are required, then it would seem desirable not to tie the amendatory language so closely to the language of the draft liability policy. By dealing only with specific cases where there may not be full protection, the amendments leave open the possibility that other cases cannot be taken care of. Moreover, the Commission's proposed language itself raises questions of interpretation. It would seem that if the committee's intent is to assure full protection to the public and to industry, then any amendatory language might be framed more simply and in terms of general principles, so as to say in effect (i) in section 170b that financial protection would not be required except to the extent that insurance was available in the United States market and (ii) in sections 170c and d that the indemnity would apply to any public liability not covered by the required financial protection.

An additional point in this connection should be made about the definition of "nuclear incident" which the Commission would amend in its proposed section 11p. This definition does no more than state the factual circumstances in which the liability protection becomes applicable. It does not define the type of liability with respect to which protection is to be provided. This purpose is served by the definition of "public liability" which appears in section 11u of the bills as introduced. Accordingly, the amendment embodied in proposed section 11p appears unnecessary.

6. Our understanding of the basic insurance situation with respect to offsite property is this: Nuclear property damage coverage is not presently expected to be generally available for such property. However, liability (including liability of one insured to another) for harm to offsite property is expected to be covered in the nuclear liability policy made available by the syndicates.

S. 715 and H. R. 1981, as introduced, contemplate indemnity against liability for offsite property (again including liability of one person indemnified to another). This leaves the reactor owner and, indeed anyone else contributing to a nuclear project, in essentially the same position with respect to offsite property as members of the general public—that is, an owner of offsite property cannot be compensated for harm to such property unless he establishes a liability on the part of some other person. Under such a system there can be cases where a particular operator or supplier could not obtain compensation for damage to offsite property, even though all other persons sustaining such damage were able to obtain such compensation.

The Commission has attempted to deal with this problem by a new section 111 which defines the term "indemnity" to include an obligation on the part of the Government to pay the persons indemnified for damage to offsite property. The specific language suggested by the Commission may be read in a number of ways. But no matter how read, the proposed amendments represent a significant alteration of the scheme of the bills, since, as we understand it, the committee intended that the bills should be keyed to liability.

If the committee believes a different approach is appropriate, then it should be recognized that departing from the premise that the bill should deal only with liability requires reexamination of other provisions. For example, the language of section 170e relating to the limit of liability, as well as the language prescribing a procedure for allocating available indemnity funds among claimants, would seem to require clarification if the Commission's amendments are accepted. Other changes might have to be made in sections 170c and 170d.

7. In their present form, the bills exclude claims under State or Federal Workmen's Compensation Acts of employees of persons indemnified who are employed in connection with the activity where the nuclear incident occurs (sec. 11*u*). The Commission amendments (sec. 11*v*) would abolish the distinction based on whether the employees were employed in connection with the activity where the incident occurs.

In last year's Joint Committee report accompanying S. 4112 (June 22, 1956) the distinction drawn in the bills with respect to workmen's compensation claims of employees is based on certain assumptions as to determination of premiums (p. 8). The Commission's explanation of its proposed amendment does not challenge these assumptions, and it does not appear necessary to make the Commission's suggested change. However, we have no objection to this change provided it is made clear that the committee is preserving what appears to be the intent of both the bills as introduced and of the Commission amendments—namely, that (i) claims of employees asserting a tort or common law liability and (ii) subrogation claims of employers or insurers are within the definition of legal liability.

8. A good deal of the testimony on the Commission amendments has dealt with the question of the protection to be afforded with respect to liability incurred by a trespasser or a stranger to the project out of which the nuclear incident arises. We share the hope expressed by some members of the committee and by others that the insurance syndicates will be able to provide coverage against liability of such persons. If, however, the syndicates are unable to do so, it would seem unfortunate if the public were denied the full protection of the Government indemnity.

Accordingly, we think that the Commission's basic approach is a sound one. However, we believe that the intent could be more simply and clearly effectuated by language in section 170*c* and section 170*d* to the effect that the indemnity would apply to public liability not covered by the required financial protection, rather than by the more elaborate language changes suggested by the Commission.

9. The bills as introduced, authorize the Commission, in determining the amount of financial protection to be required, to take into account the cost of private insurance. These provisions, as we read them, do not authorize the Commission to pass upon the reasonableness of rates but only to decide how much financial protection it will require a licensee to provide in a situation where there is only one source from which insurance may be obtained.

Presently, it appears that the rates for liability coverage, although quite high, will be livable where large facilities are involved. However, where smaller facilities and smaller companies or institutions are involved there may be a real problem. Also, it is not possible to predict what the rate situation will be in the future. We recognize the concern of the insurance companies, but on balance believe that the bills as introduced are more desirable than the Commission amendments in this area.

GENERAL ELECTRIC CO.,
April 3, 1957.

Mr. JAMES T. RAMEY,
Executive Director, Joint Committee on Atomic Energy,
Washington, D. C.

DEAR MR. RAMEY: Your letter of March 22 requested my comments on Senate bill 1684 during the hearings last week. I did not have time to prepare any written testimony and the matter did not come up in discussion.

As I understand the bill, the purpose is (1) to provide a formal status in law for the Safeguards Committee, (2) to provide that its findings shall be made public, as well as the Commission's, (3) to assure that there are public hearings with regard to safeguards.

My comments are as follows:

1. I see no objection to a formal status for the Safeguards Committee. We need a committee of some permanence and continuity and will continue to need it for another 10 years at least. It seems to me that the proposed bill provides a basis under which distinguished persons in private pursuits could serve without having to withdraw from those pursuits.

2. I favor final safeguards reports being published. Also, I believe that, as is the case at present, submissions on the question of safeguards should be public. I believe that the deliberations of any group considering these should be private. They are partly jury and partly investigators, and I think must be free to deliberate in private as is the case with any jury. My concern is not with the principle of public findings—which I endorse—but with the mechanics of obtaining free discussion and competent uninhibited analysis up to the point of public release. As I read S. 1684, this is what is contemplated.

3. I am in favor of either mandatory public hearings or notice being given in some way so that a public hearing is requisite if any responsible group wishes such a hearing. I believe that lacking such procedure, findings might be subject to retroactive attack and there will be a concomitant sense of insecurity on the part of licensees.

4. There are some possible practical problems on which I think testimony might be taken from those who are actually trying to do this job. Presently the Committee is an advisory one to the Commission and the Commission has a staff charged with this responsibility. The precise roles of the Commission staff and of the Committee and the relationships between the two groups should be carefully considered. For example, as I understand it, a Committee member can have the Commission staff perform physical analysis, thermal analysis, or any other type of work requisite to the formation of a sound opinion and presently can work back and forth in this manner. A complete barrier between the Committee and the working staff of the Commission would, I believe, result in the Committee requiring a complete staff of its own. I would certainly recommend that the ideas of those specifically engaged in this work should be obtained on this and other points.

I trust that the above observations will be of value to you.

Sincerely yours,

FRANCIS K. MCCUNE,
Vice President and General Manager, Atomic Products Division.

The CHAIRMAN. The next witness is Mr. Arthur Murphy, of the atomic energy committee of the New York Bar Association.

STATEMENT OF ARTHUR W. MURPHY, ON BEHALF OF THE SPECIAL COMMITTEE ON ATOMIC ENERGY OF THE ASSOCIATION OF THE BAR OF THE CITY OF NEW YORK

Mr. MURPHY. Thank you, sir.

The CHAIRMAN. Do you have a statement?

Mr. MURPHY. I have a statement.

The CHAIRMAN. You may proceed, Mr. Murphy.

Mr. MURPHY. My name is Arthur W. Murphy. I am appearing in behalf of the special committee on atomic energy of the Association of the Bar of the City of New York. As some of you know, I directed the atomic insurance study conducted by the Legislative Drafting Research Fund of Columbia University on behalf of the Atomic Industrial Forum. The work of the insurance study was completed last January and our recommendations are contained in the final report on Financial Protection Against Atomic Hazards, published by the Forum. It is my understanding that copies of the report have been made available to the Joint Committee.

At the outset, I should state that our committee is strongly in favor of legislation of the kind represented by H. R. 1981 and S. 715. We believe that legislation of this kind is necessary to achieve the objective of the 1954 Atomic Energy Act of securing maximum participation by private industry in the development of atomic energy. But of perhaps even greater importance is the need to provide a substantial measure of protection to the public in the event of a catastrophic nuclear accident. If the question were asked by the Joint Committee whether to enact the bills in their present form or to enact no legislation, we would unhesitatingly urge that the bill be enacted as is.

In this connection, it seems appropriate to point out that we believe that the question of protecting the public is essentially independent of any decision on the question of increased Government activity in the development of atomic power. The threat of damage to the public will be the same whether the program is carried on by

the Government itself, by the Government acting through contractors, or by private industry using its own resources. We believe that the public is entitled to financial protection against loss from any source of radiation, whether the activity involved be carried on by the Government, a Government contractor, or private industry; thus, it seems to us, that however Congress chooses to proceed, some provision ought to be made for compensating the public. The question of that compensation should be considered on its own merits independently of the problem of the proper roles of the Government and private industry in the development of atomic power.

However, we do not understand the question before the committee to be one of choosing between the legislation as is and no legislation—but rather of whether any improvements can be made in these bills before they are voted upon. We are, accordingly, appearing to suggest some changes, the adoption of which we think would strengthen the legislation.

To depart from the prepared statement for a moment, I have not had, and of course our committee has not had an opportunity to examine thoroughly the suggested amendments submitted by the Atomic Energy Commission yesterday.

I thought I might, however, depart from the prepared statement occasionally to point out the relationship between any particular proposed Commission amendment and the suggestion that we have made here so that you could see the two of them in context. In most cases I will not be able to give any opinion as to the full legal effect of the proposed amendment but I will try to tie in their suggestions where they are pertinent to what we have suggested.

Our first point concerns the provisions of section 170–d of the bills which authorizes the Commission to indemnify Government contractors. As the provision reads, it does take care of a number of the problems which now confront contractors: For example, by clearly establishing the statutory authority of the Commission to grant indemnities, it lays the basis for solving the vexing problem of the scope of indemnities granted "subject to the availability of funds." Similarly, it provides a basis for solving the problem of subcontractors who have, by and large, not been granted indemnities by the Commission and who have not been permitted to obtain from prime contractors the benefit of any indemnity the latter may have received.

The effectiveness of this provision in solving the problems of contractors may, however, be lessened by the fact that it is wholly permissive. The chief objection to this section as presently drafted, however, is that there is no assurance to the public that an indemnity will be granted.

As I stated earlier, it is our feeling that the public is entitled to the same protection in the case of an activity carried on by a Government contractor as it would be were the activity carried on by a licensee. For that reason we think that the legislation should contain a direction to the Commission to indemnify Government contractors in any case in which proof of financial responsibility would be required if the activity involved were licensed. In addition, it seems to us that any activity carried on by contractors for the Government which is not of a type that might be carried on by licensees

should be covered by an indemnity if the Commission thinks there is danger of a substantial accident. We do not mean to suggest that the Commission should be deprived of its opportunity to bargain with contractors for the most favorable possible terms; we do feel, however, that the area of bargaining should be restricted to the question of who will pay for the private insurance protection to be afforded and should not include the question of whether any protection will be furnished at all.

So far as I am aware none of the suggestions made by the Commission yesterday would change the permissive nature of section 170–d. I don't believe they made any recommendation with respect to that at all.

Our second major point concerns the question of the limitation on the amount of the indemnity and the limitation on liability.

In our statement submitted last spring with respect to the legislation then pending, we took the position that an unlimited indemnity would provide greater assurance that the public would be protected, would avoid many possible difficult administrative questions in the event of a major accident, and would eliminate any lingering doubts as to the constitutionality of the proposed limitation on private liability. We have not changed our minds on this score and we still believe that an unlimited indemnity would be preferable to an attempt to determine in advance a figure which will cover all possible liability. At the same time we recognize the reluctance on the part of Congress to assume liability without limits.

As a practical matter the amount provided by this bill may well cover any claims which could arise, and we are encouraged by the indication—which was contained in the report accompanying the Anderson-Price bill in the last session of Congress—that in the event damage exceeded the amount of protection available, Congress would take a second look to see if additional funds should be made available.

In passing, I would like to point out that the Commission did not make any suggestions with respect to this point.

A third major point concerns the scope of the program to be undertaken by the Commission. Under the license program the Commission is required to ask for proof of financial protection in cases of licenses granted under sections 103 and 104 of the act, and construction permits granted under section 185 of the act.

Such a requirement is permissive in the cases of licenses granted under sections 53, 63, or 81. On its face, this provision would seem to cover the necessary ground. We are not technically competent to determine in what cases protection must be required and in what cases it can be dispensed with. It does seem to us, however, that it should be made clear that the intention of this program is to cover all cases in which there is danger of any substantial accident from the use of radioactive material. Given that direction, the Commission can exercise the discretion it has under the present bill to require financial protection or not in cases that come before it.

One suggestion that the Commission made yesterday does have a bearing on this. They would, in their proposed amendments, revise this section substantially to state more explicitly the kinds of situations in which financial protection must be required. I could not say at the present moment whether what they have suggested is more re-

strictive than what we have suggested here or not. It is one of the things we will cover in any memorandum which we send down to you.

A final question which we would like to raise—but to which we have no ready answer—concerns the coordination of the Government indemnity with the insurance or other financial protection which may be required. I should perhaps emphasize that I am not talking here about the amount of financial protection which should be required—that point is, we think, adequately covered in the present bill since it seems to us that there is no reasonable alternative at this time to giving the Commission wide discretion to set the amount of protection to be required.

At this point I might take up very briefly the suggestion made by the Commission yesterday to delete the provision of the Price-Anderson bill which provides that in fixing the amount of financial responsibility the cost and terms of private insurance are to be considered.

I have not had an opportunity to assay that suggestion completely, nor have I had a chance to take it up with our committee. I do think, though, that on its face I would disagree with the contention of the Commission that this provision inevitably involves it in a reevaluation of the reasonableness of rates. I start with the assumption that the rates promulgated by the insurance companies are reasonable given the problems that they themselves face. I do not think it necessarily follows, however, that the Commission should not have discretion in any proper case before it to set the amount of financial responsibility lower than the total amount of private insurance which will be available. I think that at this particular stage of the game where the rates are not finalized, and where much negotiation still must go on, the Commission will need every bit of discretion it has and it can have in fixing this amount, and that in an appropriate case the cost of private insurance would be a proper factor for it to take into consideration.

To go on with the prepared statement—

Our statement here is directed to the extent to which the indemnity will cover any gaps which may exist in the coverage afforded by the financial protection required.

The objective of the program contemplated by this legislation is to afford fairly complete protection to the public, within the limits of our existing system of tort liability, and to afford atomic industry, both the operators of nuclear installations and the suppliers, an opportunity to protect itself against liability. It seems to us that in most cases the legislation will have that effect; however, it is possible that situations may arise in which industry or the public, or both, might not be protected.

As we understand these bills, the requirement of financial protection is no broader than what can be satisfied by the purchase of available private insurance.

To depart from the prepared statement for a moment, there are a number of amendments introduced by the Commission yesterday, the precise purpose of which is to make clear that the intention of the bill in this respect is made clear. I have never doubted myself that under the Price-Anderson bill the requirement of financial protection would be satisfiable by the purchase of an insurance policy and that there would be no requirement that a license do more than that. As

I say, there are 2 or 3 amendments which were suggested by the Commission, the prime purpose of which would be to make that specifically clear in the statute.

To go back again to the prepared statement—

Assuming that insurance is bought there are two kinds of situations in which industry or the public might not be wholly protected.

The first problem lies in the possibility that even up to the limit of the policy, all liability of atomic industry for a nuclear incident may not be covered. Whether all possible liability is covered by the present policy of private insurance is not yet clear to us, and, indeed, the final answer to this question may not come until courts have determined the scope of the obligation undertaken by the insurers.

The second situation would arise in the event that a person not covered by the private insurance policy is held liable. In its present form, the policy covers the operator, the suppliers and some others, but does not cover all persons who might be held liable—the example of a person not covered most frequently used being the operator of an airplane which crashed into a nuclear installation.

As the bills now stand there is no question but that the indemnity will cover the liability of all persons, whether operator, suppliers, or third parties who may become liable, above the level at which financial responsibility is required. It is not clear, however, whether liability of a person who is not covered under the policy would be indemnified below that point. A serious problem might exist for the public if such a person was the only one against whom a claim could be asserted.

To depart once again from the prepared statement, as has been discussed in these hearings, the Commission has made a specific recommendation that the indemnity to be afforded by this bill cover the so-called third party below the limit of financial protection which is required. I think myself that there are a number of conflicting considerations which ought to be taken into account by the committee, and we have made no specific recommendation as to whether there should be coverage or not.

I think, as Mr. McCune has pointed out, the important thing is to advise the committee that it is possible under this bill that there may be gaps in the protection which is afforded both to industry and to the public.

In the third party situation, to perhaps clear up a colloquy that went on between Senator Anderson and Mr. Haugh this morning, there would be no problem so far as the public was concerned if a person covered by the private insurance policy was in fact liable even though a third person might also be liable. The only problem for the public would arise in case a court at a future date would hold that the only person liable was the third party. Whether any court will do that or not is, of course, impossible to predict at this date.

Representative COLE. Have there been cases where a court has exonerated the person primarily liable but held liable the third party?

Mr. MURPHY. Under the so-called doctrines of strict liability, which many people believe will govern the operation of a reactor, there have been exceptions sometimes invoked on the grounds that damage was caused by the independent act of a third person or a so-called act of God. Such an exception could be applied here, al-

though I would think that the reactor operator might be in a different situation since so much attention has been given to making these things foolproof, that is, maybe it would be a requirement of reactor operation that it be so constructed that even if an airplane hits it, it will not run away.

Representative COLE. There is no reason why the policy could not provide for public indemnity or an incident caused by a third party or an independent person, is there?

Mr. MURPHY. I can see none.

Representative COLE. Do you see any reason why if such a provision is in the policy that it would justify a greater rate?

Mr. MURPHY. No.

Representative COLE. It could be negligible.

Mr. MURPHY Not to step into anybody else's territory, my feeling about this is that they are covering in a single policy the operator and the supplier and everybody who could conceivably be liable provided he has some prior connection with the operation of the reactor. I know of no reasson—I would be happy to be corrected or perhaps, I should say unhappy, on this point—why if you can cover in a policy some people who are now not identifiable, other people who are not now identifiable, namely the third parties, cannot be covered.

Representative COLE. Have you studied the policies?

Mr. MURPHY. Yes.

Representative COLE. Are acts of God excluded?

Mr. MURPHY. No, I don't recall that they are. The policy will cover any liability. It is my understanding and recollection of the policy that it will cover, subject to the caveat mentioned earlier that there may be some gaps in the coverage, any legal liability of the operator. So if a court should impose liability on the operator of a reactor, regardless of whether an act of God caused the reactor to run away, that liability would be covered under the present insurance policy. They do read out war damage. But it is not my recollection that they attempt to exclude any liability in other cases.

Representative COLE. Since these policies do cover damages caused by acts of God, I have difficulty in finding a good argument for not also including damages that are caused by an independent person.

Mr. MURPHY. I am on your side on this point.

Representative COLE. When you were here this morning, I tried my best to get a good argument from Mr. Haugh on it and he did not indicate one.

Mr. MURPHY. I was listening with bated breath.

I think there was some confusion this morning as to the question of liability. I think there was some argument at cross purposes. I did not understand your suggestion to be that the policy should cover situations in which there was no legal liability at all. I understood your question to be the one that you have asked me: Couldn't an insurance policy be written which would cover the liability of any person who may become liable?

Representative COLE. Where could there be a damage without a liability for causing a damage on the part of somebody?

Mr. MURPHY. If the courts behave properly I do not think there can be a situation. It is perfectly possible when you are talking about 10 years from now that the courts might say, as they have in the act of God situation, that none is liable.

Representative COLE. This is a hazard of being alive and you must suffer the consequences.

Mr. MURPHY. I personally feel that given this legislation and given the private insurance coverage which will be available that it is extremely unlikely that in the event of an accident any court is not going to find that it can under one theory or another fix liability. I would think, as Mr. Haugh said today, that it is most likely that it will be fixed on the reactor operator.

Representative COLE. How extensive is that legal principle of absolute liability followed in the various State jurisdictions?

Mr. MURPHY. I could not give you a State-by-State breakdown. But under one form or another, there is a rule of strict liability in every State that I know of. Some call it an ultrahazardous activity doctrine. Some of them analogize it to the old trespass or nuisance doctrines. But ultimately they cover pretty much the same situations. There are some States which have specifically rejected the English case which was the forerunner of this doctrine and then brought in precisely the same doctrine through the back door.

I think in one form or another there is a strict liability doctrine in almost every State. Whether it will be imposed or not is another thing.

Representative COLE. Do I understand you correctly to say that all State jurisdictions have imposed liability on the owner of an instrument which causes the damages, even though there has been no negligence on his part if the damage initiated from the act of an independent person?

Mr. MURPHY. There just is not enough law on that one. The independent act of a third person is not a universal exception to the doctrine of strict liability. It has been imposed in some cases. How valid it is, I don't know. I mention it only because it does exist. I am reasonably confident myself that given, once again, the kind of insurance protection that the private insurance people have made available and given the overriding Government indemnity that there will be very little reason for a court not to assess liability on the owner of a reactor for all damage which is caused as a result of the operation, whether you can casually trace it to a third party or not.

Shall I go on?

The CHAIRMAN. Yes.

Mr. MURPHY. It is too early to say with any certainty whether these situations will arise—the possibility that they may does, however, pose a policy question for this committee as to whether the indemnity should be so worded as to cover any possible gaps.

In preparing this statement, we have concentrated on the major changes which we think ought to be made in the pending legislation, and I will not try to cover the minor, or drafting, changes which we think might also be made. An example of the latter is the provision in section 170–f of the bill that the fee for licenses under section 103 shall be $30 per year per 1,000 kilowatts of thermal energy; while this standard would be appropriate in the case of reactors, which can be classified in terms of heat output, it would not seem to cover the case of a facility—such as a reprocessing plant—which could not be so classified.

I think that is the kind of minor drafting amendment that would be picked up in the normal progress of this legislation.

We have not on this occasion—as we did last spring—prepared any detailed suggestions as to drafting, largely because we did not know at the time the statement was prepared whether the Commission would submit a suggested redraft. If the committee or the staff would like us to submit such suggestions, we will endeavor to do so as quickly as possible.

In closing, I would like to emphasize again on behalf of our committee that we feel that the legislation which has been suggested by the committee and the staff is essentially sound and is a significant contribution to the solution of a difficult problem. We are, of course, prepared to assist you and the staff at all times in any way within our capacity.

The CHAIRMAN. Thank you very much, Mr. Murphy, for your excellent statement. We appreciate you taking your time to give us your thoughts on this matter.

Representative COLE. On that point, Mr. Chairman, I think that the joint committee should acknowledge its indebtedess to his organization for the great help that he has been to the committee in studying this problem and suggesting drafts of the legislation which is before us. It has been very very helpful. I think he has done a magnificent job. The committee and the Congress and the public are greatly indebted to you and your committee.

Mr. MURPHY. Thank you, sir.

The CHAIRMAN. At this point I was going to ask permission to place in the record the summary of the problem in the report which I think is one of the best things I have seen, and the recommendation included in the report. I read it twice, which is unusual for me.

(The portion of the report of the Atomic Industrial Forum, Inc., referred to, follows:)

SUMMARY OF THE PROBLEM

1. The development of atomic energy, especially for power purposes, calls for operations involving substantial quantities of radioactive material. And there is, despite every safety precaution, a possibility, however remote, of a catastrophic accident.

2. From the viewpoint of atomic industry, the primary financial protection problem is that posed by the threat of huge liability to the public arising from such an accident. Under existing legal rules, the operator of an atomic installation, and in some circumstances the suppliers, may in the event of a serious accident be subject to tort liability far beyond that ever previously imposed.

3. Although private insurers are expected to offer to atomic industry insurance coverage many times greater than that available in other industries, the magnitude of the risk is such that the potential liability cannot be covered by private insurance alone.

4. In the license program, the possibility of unprecedented liability for a catastrophic accident is a serious deterrent to the broad private participation that has been a major objective of the Atomic Energy Act of 1954. Although private industry is participating in atomic-energy development under Government contract, many questions remain as to the adequacy of the financial protection now afforded contractors.

5. As matters now stand, one of the most significant results of a serious accident could be that members of the public in large numbers would have to bear a major share of the losses.

6. The National Government has a double responsibility: (*a*) to remove the major roadblock which the financial protection problem opposes to broad, effective participation by private industry in the rapid development of atomic power; and (*b*) to provide substantial assurance to the public that it will be compensated for losses that may result from that development. There is wide agreement among the interested parties that the financial-protection problem calls for the establishment of some program by the National Government.

IV. Recommendations for a Program by the National Government

Given the need for some action by the National Government, there are two basic objectives which must be met by any program: first, the public should be given protection against financial loss because of personal injuries and property damage due to radiation; and second, atomic industry should be protected against the possibility of overwhelming losses from liability in the event of a catastrophic accident.

In succeeding pages we explore the requirements of a Government program to meet those objectives within the existing framework of tort liability. The discussion deals primarily with the needs of a program covering licensed activities; the requirements of a program covering contract activities are treated separately. Consideration is given thereafter to the feasibility of a Government program to offer direct insurance to the public and proposals for substitution of a "compensation plan" for tort liability. In a concluding subsection, the impact of the financial protection problem on international atomic activities is briefly discussed.

Before any examination of the elements of a Government program, one general observation should be made; a major characteristic of any program should be the avoidance of elaborate machinery. In view of the present limits of knowledge and experience, the program should be simple, pragmatic, and responsive to changing needs. Many problems which will arise cannot be foreseen, and the more elaborate the program the less adaptable it will be to meet changed circumstances. An additional reason for avoiding a large and costly mechanism at the outset is that the primary role of the Government will be to protect against loss in the event of a catastrophe and not, as in programs such as crop insurance,[268] and the new flood-insurance program,[269] to insure against reasonably expectable and recurring losses. Protection against loss other than from a catastrophe will be available from private insurers.[270]

A. A program within the framework of tort liability

Several suggestions have been made as to the method, within the framework of tort liability, by which the Government could proceed in an effort to solve the problem of liability for a catastrophic accident. They have included a statutory limitation on liability, a voluntary Government excess insurance or reinsurance program, and indemnity legislation.[271] These three suggestions are dealt with in order. Since an indemnity program, combined with private insurance, appears to offer the best hope of a simple solution to the problem of industry and the public, most of the discussion is devoted to that approach.

1. Limitation on liability

The most direct method of solving industry's problems would be to limit liability at the point where insurance ceases to be available.[272] Proposals for such a limitation have been compared to the limitation on the liability of a ship-

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[268] Federal Crop Insurance Act, 52 Stat. 72 (1938), as amended, 7 U. S. C. A. 1501 et seq. For a detailed report on the history of the crop-insurance program see Federal Disaster Insurance, supra, note 257, at 272 et seq."

[269] Federal Flood Insurance Act of 1956, 70 Stat. 1078. For a history of proposals leading up to the enactment of this statute, see Federal disaster insurance, supra, note 257."

[270] As noted earlier, the situation with respect to direct property coverage of the public is not yet clear. See the discussion at p. 57, below."

[271] See Satterfield, The Position of the AEC in the Insurance Problem, minutes of the fourth annual conference of the National Industrial Conference Board on Atomic Energy in Industry (1955), p. 394, 395. The three approaches mentioned in the text were represented in bills introduced in the 2d sess. of the 84th Cong. (1956): H. R. 9802 (limitation of liability); H. R. 11242 (Government excess insurance); and H. R. 9701, S. 3929, H. R. 11523, S. 4112 (indemnity)."

[272] The determination of the point at which insurance becomes unavailable would raise complex problems similar to those involved in determining the point at which an indemnity should begin (see infra, p. 50).

owner [273] and to the somewhat different limitation on the recovery of persons injured injured by airplanes outside the continental limits of the United States.[274] In contrast to the limitation on shipowners' liability which is clearly within the National Government's admiralty power, and the limitation on liability for airplane accidents established under the treaty power, a national limitation on liability for atomic activities would raise serious questions of Federal-State relationships.[275] An even more important drawback is that the limitation would deny the public the protection it needs, and would, therefore, be objectionable whether enacted by the National Government or by the several States.[276]

The West German atomic energy statute follows, in part, the limitation on liability approach. After declaring a standard of absolute liability for accidents at atomic plants,[277] the statute establishes an overall limitation of liability for each accident, and limits the recovery of any person injured who sues under the statute.[278] However, the statute apparently does not limit liability for accidents caused by negligence.[279] It is doubtful whether, in this country, where the line between strict liability and negligence is frequently tenuous, a similar statute would afford atomic industry sufficient protection. In any event, it would not afford sufficient protection to the public.

2. Voluntary excess insurance or reinsurance

Before the other suggested methods of meeting the liability problem—excess insurance or reinsurance, and indemnity—are discussed, one point of terminology should be made clear. Liability insurance contracts and indemnity agreements are similar in objective: in both one party agrees to compensate another for loss in the event of certain contingencies. Indeed, the terms are frequently used interchangeably. For purposes of our discussion, however, in the remainder of this report, the term "Government insurance" will mean a scheme which involves the main elements of a private insurance system—premium rates and a fund into which premiums are paid and out of which payments for losses are made. "Government indemnity," as the term is used here, will mean a scheme involving neither premium rates nor a fund, although a charge may be made for the protection afforded.

There is general agreement that whatever Government program is adopted, insurance or indemnity, there should be room for the activity of private insurers, and that the Government should not cover liability from the ground up. Total Government indemnity would be at odds with the intent expressed in the 1954 act to develop atomic energy within the framework of private enterprise where consistent with overall objectives. Furthermore, such action would be contrary to the practice which the Government has generally followed in other "insurance" programs.[280] Where the Government has entered an area of possible conflict with private insurance, its entry has usually been conditioned on the nonavailability of insurance in the private market.[281] Although we agree in

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"[273] The liability of a shipowner is limited to the value of his interest in the ship and 'freight then pending,' except that at least $60 per ton must be available for loss of life or bodily injury. R. S. sec. 4283 (1875), as amended, 46 U. S. C. A. 183."

"[274] Art. 22 of the Warsaw Convention on International Air Transportation, 49 Stat. 3019 (effective October 29, 1934), limits the liability of the carrier to a stated amount for injury to a passenger, or damage to property carried. The Rome convention, to which the United States has not agreed, limits overall liability for surface damage according to the weight of the airplane."

"[275] Because of the conclusion that a limitation of this kind is undesirable, the constitutionality of such a limitation, whether enacted by Congress or the States, has not been considered. See note 312, infra."

"[276] "If it is felt desirable to support an industry, the way to do so is by subsidizing it, not by burdening incidental victims with the damages caused by it." Drion, Limitation of Liabilities in International Air Law (1954), p. 12. For a general discussion of the rationale of limitations on liability, see id., ch. 1."

"[277] Sec. 20, German Atomic Energy Law. An 'atomic plant' seems to be generally equivalent to a 'production or utilization facility' under the United States Atomic Energy Act of 1954."

"[278] Sec. 26. The overall limitation is 25 million marks."

"[279] Sec. 29 seems to preserve a cause of action for special damages, such as loss of services and pain and suffering if the plaintiff can prove negligence. It is not clear whether damages for injury to property can be recovered above the limit set by the statute."

"[280] National service life insurance and World War II war risk cargo insurance are exceptions. In both cases there were special reasons, not present here, for establishing a competitive program. On the other hand, the Government has utilized private insurers to write Federal employees' group life insurance, 68 Stat. 736, 5 U. S. C. A. 2091. In the case of workmen's compensation, some State governments compete with private insurers; other State funds preempt the field to the exclusion of private insurers. See 2 Larson, supra, note 137, at 444."

"[281] Sec. 12 (a) of the Federal Flood Insurance Act of 1956, supra, note 269, provides that no insurance shall be issued covering a risk 'against which insurance is available on reasonable terms from other public or private sources.' "

general that a Government program should be so conditioned, there remain a number of difficult questions as to the precise point at which such a program should take effect.

The voluntary Government excess insurance, or reinsurance,[282] approach was embodied in a bill proposed by the Commission in May 1956.[283] Under that bill the Commission would have been authorized to sell "indemnity" coverage to private industry "in excess of the amount of nongovernmental insurance * * * generally available on the open market," or to reinsure coverage provided by private insurers.[284]

The major defect of voluntary excess insurance, or reinsurance, is that to some extent the protection of the public would be dependent on the business judgment of the operator. No matter how nominal the cost, there would be some persons who would not buy sufficient insurance. Furthermore, if it were to have any meaning, it would put the Government in the unhappy position of having to treat victims of separate accidents differently because the operators had made different business judgments as to the desirability of insurance coverage.[285]

This defect could be remedied by requiring the operator of an atomic installation to purchase insurance. But a compulsory insurance program would encounter substantially the same difficulties as those of the indemnity program discussed below; and any Government insurance program, whether compulsory or not, is subject to the further objection that it requires an unnecessarily elaborate structure. A solution to the financial protection problem does not require the establishment by the Government of a schedule [286] of premiums or a fund [287] for the payment of losses. As was recognized by the Joint Committee in its report on the Anderson bill, any rate established will either be woefully inadequate to cover losses in the event of an accident, or—since there may never be an accident sufficiently serious so that the Government is called upon to make payments—too large.[288]

"[282] Private insurers have stated that they are not interested in a Government reinsurance program. See, e. g., letter of Black, hearings, supra, note 104, at 384; and memorandum of R. Murphy, id., at 403."

"[283] See hearings, supra, note 104, at 44–46, later introduced as H. R. 11242, 84th Cong., 2d sess. (1956)."

"[284] Sec. 169–1a (3)."

"[285] In the case of war damage, where presumably the potential injured would have the option of purchasing or not purchasing Government insurance, doubt has been expressed that the Government would find it desirable to make payments only to those who bought the insurance. Hearings before a subcommittee of the Committee on Banking and Currency, U. S. Senate, on S. 114, S. 439, S. 1309, and S. 1848 (War Damage Corporation Act of 1951), 82d Cong., 1st sess. (1951), p. 239."

"[286] H. R. 11242, supra, note 283, sec. 169–1b, provided:

"The Commission shall make an annual charge for indemnity coverage at such rates as it deems reasonable after taking into consideration (1) the scale of premiums charged or which would be charged by private insurance companies for public-liability coverage of the facility involved, and (2) the objective of establishing rates which will not tend to discourage widespread participation in the development and utilization of atomic energy for peaceful purposes. Such rates shall be established for each increment of indemnity coverage as determined by the Commission. The basis for such rates shall be incorporated in a schedule which shall be published by the Commission."

For an indication of the difficulty of formulating such rates, see hearings, supra, note 104, pp. 11 et seq.

"[287] H. R. 11242, supra, note 283, sec. 169–1e, provided:

"There is hereby established a Federal atomic hazard indemnity fund for use by the Commission in carrying out the functions authorized by this section. The net proceeds derived by the Commission from indemnity fees and reinsurance premiums collected under subsecs. (b) and (c) shall be deposited in the Federal atomic hazard indemnity fund. Moneys in the fund not needed for current operations of the Commission under this section may be invested or reinvested by the Commission, with the advice of the Secretary of the Treasury, in all obligations which are lawful investments for fiduciary, trust, or public funds of the United States."

"[288] S. Rept. No. 2298 (H. Rept. No. 2531), 84th Cong., 2d sess., at 6 (1956):

"A system of indemnification is established rather than an insurance system, since there is no way to establish any actuarial basis for the full protection required. The chance that a reactor will run away is too small, and the foreseeable possible damages of the reactor are too great to allow the accumulation of a fund which would be adequate. If this unlikely event were to occur, the contributions of the companies protected are likely to be too small by far to protect the public, so Federal action is going to be required anyway. If the payments are made large enough to insure that there is an adequate fund available, the operation of the reactors will be made even more uneconomic. On the other hand, if, as the Joint Committee anticipates, there never will be any call on the fund for payments, the funds will have been accumulated to no purpose. Hence, in this instance it seemed wisest to the Joint Committee not to treat this as an insurance problem but to treat it as an indemnification problem. There seems to be no real need for establishing all of the technical mechanism of an insurance fund in this situation."

For a contrary view on the desirability of establishing a fund, see letter of Brundage, Director of the Bureau of the Budget, hearings, supra, note 104, at 405–406."

3. Indemnity

The indemnity approach is embodied in the Anderson bill which was reported out by the Joint Committee in the last session of Congress.[289] There are three major features in the bill. There is first a requirement of financial responsibility as a condition of licensing certain activities. Secondly, above the level of financial responsibility required, the Government would indemnify the licensee and all suppliers against any liability to the public for damage caused by radiation. The amount of the indemnity provided is $500 million for each "nuclear incident." [290] Third, a limit is placed on the liability of all persons for any single accident, the limit being the amount of the indemnity plus the amount of financial responsibility required. Because, in general, the recommendations of this report are in substantial agreement with the approach followed in the Anderson bill, we shall discuss its provisions concurrently with our recommendations, noting the points on which there is disagreement.

Any proposal for a Government indemnity of licensees encounters a first barrier in section 53e (8) of the Atomic Energy Act of 1954, which provides that licenses for the possession of special nuclear material "shall contain and be subject to the following conditions * * * (8) the licensee will hold the United States and the Commission harmless from any damages resulting from the use or possession of special nuclear materials by the licensee." [291] The precise meaning of this provision is not clear, and its legislative history gives little additional light.[292] Literally read, the provision seems to require the licensee to indemnify the Government against any tort liability to third parties which the Government might incur, as well as against any loss suffered by the Government because of damage to Government property. Some have suggested that the provision should be narrowly construed to cover only damages assessed against the Government because of its retention of ownership of the special nuclear material.[293] However the section is read, it is clearly inconsistent with a Government undertaking to indemnify the licensee.[294]

The Anderson bill attempts to avoid the problem posed by section 53e (8) by making the section inapplicable to the extent that an indemnity is granted to a licensee.[295] Although the provision removes the bar to Government indemnification of licensees, it leaves the meaning of section 53e (8) in doubt. As long as the provision is being amended, a clarification of its meaning would seem desirable.

(*a*) *The requirement of financial responsibility.*—A major problem in a Government indemnity program that does not cover liability from the ground up, is to assure protection of the public below the point at which the indemnity begins. The best way of providing such protection is to require as a condition of the license that a licensee furnish the Commission with proof of his ability to respond in damages for liability to the public up to the point at which the Government indemnity takes effect.

The Anderson bill contains such a requirement.[296] The imposition of a requirement of proof of financial responsibility raises, among others, the following questions: Should the requirement apply to all licenses granted by the Commission? What proof should satisfy the requirement? Should it be required only

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"[289] Report, supra, note 288. The report was agreed to by all members of the committee but one, Representative Holifield dissenting on the ground that in the present state of reactor knowledge and experience, reactors should be built at isolated Government-owned sites."

"[290] The provisions of the Anderson bill are set forth in an appendix to the report, infra, pp. 63–65. For a definition of 'nuclear incident,' see sec. 11 (o)."

"[291] 68 Stat. 931 (1954), 42 U. S. C. A., sec. 2073 (e) (8)."

"[292] The "hold harmless" clause was inserted in the committee print of May 21, 1954, joint committee print, draft in bill form incorporating changes proposed to be made in H. R. 8862 and companion bill S. 3323, 83d Cong., 2d sess. (May 21, 1954). The draft language was changed as follows: "applicant" became "licensee," and "or possess" and "by licensee" were added. The only special reference to the provision in the legislative history is in the comments by General Electric Co. accompanying the letter of McCune, hearings before the Joint Committee on Atomic Energy on S. 3323 and H. R. 8862 (to amend the Atomic Energy Act of 1946), 83d Cong., 2d sess. (1954), p. 349, where it was stated: "such sweeping language might even include damage resulting from the negligence of the Commission or its employees." Marks and Trowbridge, supra, note 5, at 103, conclude that "it places on the licensee and perhaps his private suppliers all physical risks associated with the operation of reactors."

"[293] See comments accompanying letter of McCune, supra, note 292."

"[294] American Bar Association report, supra, note 146; Marks and Trowbridge, supra, note 5, at 58, state that even without sec. 53e (8), '* * * it is doubtful whether the Commission could assume on behalf of a licensee the financial risk of an atomic-accident.' "

"[295] See infra, app., p. 63; report, supra, note 288, at 7."

"[296] Secs. 170a and b, infra, App., p. 64."

that such financial protection be available as is necessary to cover the liability of the operator or should the possible liability of others be covered as well? What amount of financial responsibility should be required?

The Anderson bill requires proof of financial responsibility in the case of all licensees for production or utilization facilities and gives the Commission power to require such proof in the case of licenses granted for the possession of special nuclear, source, and byproduct materials.[297] Although it is not possible at this time to specify all of the types of activities with respect to which proof of financial responsibility should be required, any list certainly should include all activitiess involving substantial amounts of radioactivity.[298]

With respect to the nature of the proof of financial responsibility, it does not seem necessary that operators should be required to purchase insurance if they can satisfy the Commission that funds will be available to pay damages. The Anderson bill provides that the requirement may be satisfied by "private insurance, private contractual indemnities, self-insurance, other proof of financial responsibility, or a combination of such measures." [299] This provision would appear to give the Commission sufficient discretion. As a practical matter, most licensees will probably take out insurance.[300]

If the public is to be fully protected, it is important that the proceeds of insurance (or other device by which the requirement of financial responsibility is satisfied) be available not only to cover the liability of the operator but also the liability of any other person, including a supplier or a third party, who might be held liable. On its face, the Anderson bill seems to provide that the financial protection required of the operator must cover the liability of any person for a "nuclear incident" at the atomic installation.[301] However, since it appears that the insurance to be offered by the syndicates will cover only the liability of the operator and suppliers, a broader requirement may be difficult to meet. In practice, financial protection which is available to satisfy claims against the operator and any of the suppliers may suffice.[302]

To require proof of financial responsibility will not, of course, solve all problems of the public, even up to the limit of the requirement. A prerequisite to recovery will be proof of legal liability. Such a requirement will, however, make certain that if legal liability is established, assets will be available to satisfy any judgment which is obtained.[303]

The most difficult question is the amount of financial responsibility to be required of each licensee. Clearly, it should not exceed the amount of liability insurance available from private insurers and the Anderson bill so provides.[304]

"[297] Sec. 170a, infra, App., p. 64. Construction permits under sec. 185 of the Atomic Energy Act of 1954 are within the mandatory provisions of the bill. A problem is posed by the transportation of radioactive materials, because the transportation companies are not required to obtain a license for shipping special nuclear or byproduct mterials. See supra note 49. The best solution to this problem appears to be for the operator of the installation shipping or receiving the material to provide financial responsibility for such activity."

"[298] An example of a type of activity for which proof of financial responsibility is not required by the statute, but probably should be required by the Commission, is fuel fabrication, at least where uranium-233 and plutonium-239 or any irradiated fuel is used. See supra, p. 12, and see Report, supra, note 288, at 10."

"[299] Sec. 170a, infra, App., p. 64. See also Report, supra, note 288, at 10. Although most persons who buy insurance will presumably purchase insurance from the syndicates formed for that purpose, satisfactory private insurance from other sources, if any should be available, should also be accepted."

"[300] Compare the experience in workmen's compensation, where although proof of financial responsibility may usually be proved by methods other than insurance, practically all employers are insured. Mowbray and Blanchard, supra, note 124, at 157."

"[301] The bill defines the requirement of financial responsibility in terms of 'public liability' (sec. 170a) which is defined (sec. 11 (u)) as "any legal liability arising out of or resulting from a nuclear incident." However, sec. 170b provides that one of the factors to be considered in fixing the amount of financial responsibility shall be the "terms of private insurance." That provision would seem to indicate that the requirement of financial responsibility would not be broader than could be satisfied by the purchase of private insurance."

"[302] If strict liability is imposed on the operator for all damage caused by the operation of the installation, the requirement of financial responsibility would afford complete protection up to the limit of the requirement. It should be noted that it is possible to construe the Anderson bill to provide protection for the public even where a third person is held liable but not the operator nor any suppliers. The bill provides that the Government indemnity shall take effect above the level of financial responsibility required and shall cover the legal liability of any person who may be held liable. These provisions can be read to mean that as to legal liability not covered by the requirement of financial responsibility, the indemnity shall begin at the ground."

"[303] Cf. Lambert, NACCA—Rumor and Reflection, Harvard Law Record, December 6, 1956, p. 2, 3. "The intractable personal injury problem today, more acute even than delay in trial or settlement, is the age-old quest for a financially responsible defendant."

"[304] Sec. 170b, infra, app., p. 64. It would seem that under this section, for purposes of determining 'the amount of liability insurance available from private sources,' the amount of insurance offered by the syndicates should be considered the maximum available."

It is not so clear whether in all or in some cases, the requirement should be less than the amount of available insurance. If the public is to be fully protected, the upper limit of the requirement of financial responsibility and the point at which the Government indemnity takes effect should coincide. Thus it is appropriate to discuss both questions together.

(*b*) *The extent of the indemnity.*—(i) The point at which the indemnity should begin: The consensus of opinion that a Government indemnity program should not conflict with the activities of private insurers was stated earlier. Whether or not that ideal will be attainable cannot be determined until more is known about the rates for private insurance, and particularly the graduation of rates for higher limits. The problem is especially troublesome since in order to protect the public, the operator will be required to furnish proof of financial responsibility up to the point of the indemnity, and in many cases he will be able to satisfy that requirement only by the purchase of insurance.

The problem is especially severe in the case of small reactors and other installations. Although rates will, to some extent, reflect relative hazards, the price to a small reactor, or other facility, of the upper limits of coverage is not expected to be substantially lower than the cost to a large power reactor. If the full amount of available insurance were required of the operators of such installations, the cost might make economic operation impossible.[305]

The Anderson bill provides that the Commission shall take into account such factors as "(1) the cost and terms of private insurance,[306] (2) the type, size, and location of the licensed activity and other factors pertaining to hazard, and (3) the nature and purpose of the licensed activity."[307] It seems to us that there is no present alternative to giving the Commission broad flexibility in fixing the level of financial responsibility, and the Anderson bill provides the necessary flexibility. While its job will not be easy, the Commission should be able to establish broad categories of installations for which the Government indemnity might start at varying points. Within these categories, except perhaps for research reactors operated by universities or other nonprofit installations to which special consideration might be given,[308] no distinction should be made between different operators on the basis of ability to pay. If the Commission desires to treat operators differently on the basis of ability to pay, it has ample authority to do so directly in a research and development contract.[309]

(ii) What should be the extent of the indemnity? The Anderson bill provides for an indemnity of $500 million above the amount of financial responsibility required of the operator. The bill couples the limit on the indemnity with a limitation on the total liability of all persons for a single accident to the amount of the indemnity, plus the amount of financial responsibility required.[310]

As a practical matter, the indemnity afforded by the Anderson bill may cover all damage even in the event of a catastrophic accident. Furthermore, there is an implied promise in the bill that Congress will reexamine the amount of the indemnity should the damage from an accident exceed the amount of the indemnity plus the level of financial responsibility required.[311]

While $500 million may cover all contingencies, and while we recognize the reluctance of Congress to assume an unlimited commitment for any accident, to

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"[305] Even in the case of large power reactors the cost of providing financial protection could be an important factor in the cost of power. The impact of such costs on the achievement of competitive atomic power cannot be determined until more is known about other costs of nuclear power generation."

"[306] It should be pointed out that the purpose of this provision does not appear to have been to authorize the Commission to duplicate the examination by State regulatory agencies of the rates and terms of insurance. The inclusion of cost as a factor to be taken into account by the Commission was explained in the report (p. 11) as follows:

"One point of caution should bementioned. The reference to the cost of insurance in this subsection is not intended to encourage the Commission to undercut the amounts of private insurance provided at reasonable rates. Since the program is so new, and no rates are yet established, the Commission must be in a position to set the amount of financial protection required at an amount lower than amount of private insurance offered if the rates appear high and all other factors indicate a lower mount is appropriate. Instead, it is merely to give the Commission a chance to look at the economics of the operation of the particular kind of reactor in deciding the amount of financial protection which may be required."

"[307] Sec. 170b, infra, App., p. 64."

"[308] Power to give special consideration to such institutions is contained in the Anderson bill, see sec. 170b (3), infra, App., p. 64. See Report, supra, note 288, at 11."

"[309] In other areas 'the AEC has taken the forthright position that financial assistance to private power reactors should be in a form which can clearly be identified and measured.' Marks and Trowbridge, supra, note 5, at 45."

"[310] Secs. 170c and e, infra, App., pp. 64–65."

"[311] See sec. 170e, infra, App., pp. 64–65, and Report, supra, note 288, at 11."

limit the indemnity is to some extent inconsistent with the objective of protecting the public, since damages may exceed any limit set. Moreover, the limitation on liability raises the prospect of a number of difficult administrative problems in the event of a serious accident.[312] The limitation on the amount of the indemnity is not required by public policy:[313] the Government has already given unlimited indemnities to contractors in the atomoc-energy program and elsewhere, and the Government has a continuing unlimited commitment to respond in damages for liability incurred under the Federal Tort Claims Act. In the circumstances, since the amount of damage cannot be predicted, it would seem better to give an unlimited indemnity than to try in advance to pick a figure based on little more than the hope that it will prove to be larger than the amount of damage from any single accident.

(iii) The charge for the indemnity: Industry spokesmen have indicated that they would not object to a charge for a Government indemnity provided that it would not impose too great an economic burden. In the Anderson bill a fee was set at $30 per year per megawatt of thermal energy capacity for commercial licensees, under section 103 of the act.[314] For licenses under section 104,[315] the fee may be reduced. For other licenses, the Commission is directed to make "such nominal charges as it deems appropriate." The making of a moderate charge seems unobjectionable as long as it is recognized that any charge must be arbitrary, and as long as it is not considered an insurance premium or put into a special fund.[316] The moneys collected can be used to defray the cost of administration of the program. It should be stressed, however, that a charge, if one is made, should not be regarded as consideration for the protection afforded by the indemnity. Since it is hoped that the indemnity will never be called into play, the program may cost the Government nothing more than the cost of administration,[317] which promises to be nominal. Moreover, while private industry receives protection against the possibility of ruinous liability, the Government receives the needed participation by industry in the atomic energy program. Most important, the Government will at the same time be establishing a system which will protect the public.

"[312] See p. 56, infra. Because we believe that the limit on the amount of the indemnity and, consequently, the limitation on liability are unnecessary, we have not examined the question of the constitutionality of a limitation on liability. So far as the power of the National Government, vis-a-vis the States, is concerned, it seems to us that the question is similar eto the question of the constitutionality of the Atomic Energy Act of 1954. With respect to a due process objection to a limitation on liability, a provision like the Anderson bill which couples the limitation with a substantial indemnity would seem to be on sounder ground than a naked limitation on liability. For an opinion as to the constitutionality of the provision in the Anderson, see memorandum submitted by Pennsylvania Power & Light Co., hearings, supra, note 104, at 386–390."

"[313] In contrast the possible impact of war damage could be so great that full reparation by the Government would not be justified. See statement of Elmer B. Staats, Assistant Director of the Bureau of the Budget, hearings before a subcommittee of the Committee on Banking and Currency, U. S. Senate, on S. 114, S. 439, S. 1309, and S. 1848 (War Damage Corporation Act of 1951), 82d Cong., 1st sess. (1951), pp. 225–247. In World War II, the War Damage Corporation issued policies having, at any one time, a maximum aggregate contingent liability of $140 billion. However, Congress only authorized the Reconstruction Finance Corporation to supply the War Damage Corporation $1 billion to carry out its program and thus limited the Government commitment to that amount. 28 Encyclopedia Americana 677 et seq. (1950). See also Hirshleifer, Compensation of War Damage: An Economic View, 55 Col. L. Rev. 180, 190–191 (1955)."

"[314] Sec. 170f, infra, appendix, p. 65."

"[315] It should be noted that at present all licenses granted and applied for have been under sec. 104 of the Atomic Energy Act of 1954 (43 U. S. C. A. 2134). Under the regulations promulgated by the Atomic Energy Commission, 21 Fed. Reg. 9354 (1956), those who hold licenses obtained under sec. 104 will not be required to obtain a sec. 103 license after a Commission finding that a facility of the type covered by the license has been demonstrated to be of practical value. The existing license or permit will continue to be valid, and need not be converted before its expiration date."

"[316] On the other hand, the concept of a Government indemnity program without any charge is not unknown. For example, we now have a Servicemen's Indemnity Act which replaced in-service insurance for the Armed Forces (65 Stat. 33, as amended, 68 Stat. 780 (1954), 38 U. S. C. A. 851). During World War II, war-caused injuries to civilian employees of Government contractors were handled by an indemnity program (56 Stat. 1028 (1942), as amended, 42 U. S. C. A. 1701). In connection with the proposed war damage insurance program of 1951, the Bureau of the Budget opposed an insurance program and advocated an indemnity program (hearings before a subcommittee of the Senate Committee on Banking and Currency on S. 114, S. 439, S. 1309, and S. 1848 (War Damage Corporation Act of 1951), 82d Cong., 1st sess. (1951), p. 173). Neither program was adopted."

"[317] The difficulty in fixing a proper rate in the absence of loss experience is exemplified by the experience of the War Damage Corporation. The premium for war-damage insurance was based at best on a guess, with the 'hope' that the premiums would cover lessees. In about 2 years nearly $250 million in premiums had been collected. Total losses amounted to only $1,274,000. Yet a single successful enemy bombing attack upon a metropolitan center could have made premiums insufficient to pay losses (id., at 126)."

(c) *Indemnities under the contract program.*—If industry and the public are to be adequately protected, an indemnity program should cover contract activities as well as those under the license program. Because of the Commission's practice of including indemnity agreements in many prime contracts, some of the needed protection is already provided. However, as noted above, a number of problems remain unsolved. Subcontractors have not been given indemnity protection; most indemnity agreements contain a variety of exclusions; and nearly all, if not all, indemnities are explicitly or impliedly "subject to available funds." These restrictions on the scope of the indemnity are significant not only to the contractors but to the public as well, since, to the extent liabiliy is not covered by an indemnity, protection is not provided to the public.[318]

In the Anderson bill, the Commission was given authority to treat contractors in a manner similar to licensees, and the protection of an indemnity granted under the act extends to subcontractors as well as prime contractors. The authority is limited to the Commission's own contracts and to "contracts and projects which the Commission may enter into jointly with other agencies of the Government." [319]

For these activities, at least, the Anderson bill provides adequate statutory power to grant indemnities. If the Commission exercises the authority granted, the problem of subcontractors will be solved. They would then be in the same position as suppliers under the license program. In addition, indemnities granted under the statute would not be subject to the various exclusions now written into Commission indemnities.[320] Despite these improvements, however, the bill does not go far enough.

The aim of the bill should be to provide as much protection to the public with respect to contract activities as it will have in the case of licensed activities. Consequently the provision dealing with contractors should be mandatory, at least to the same extent as in the license program. As long as it is optional, the protection of the public will be dependent on bargaining between the contractor and the Government agency. Furthermore, indemnities should be granted, as in the license program, in the case of all activities involving substantial amounts of radioactivity.[321] Finally, provision should be made for the contracts of all Government agencies with respect to atomic activities.[322]

The protection of the public does not require, however, that in all contracts the Commission or other agency should indemnify against liability from the ground up. Ordinarily, in cost-plus-fixed-fee contracts, the Commission will indemnify from the ground up since it will not want to pay the cost of private insurance. For other kinds of contracts there should be room to bargain over the question of who will provide the protection. The mechanics by which this is accomplished do not seem important. It is important that, whatever method is adopted, the public be protected.

(d) *Administrative problems.*—One advantage of the program proposed above is that it would normally require little administration. Once the amount of financial responsibility required is fixed and the indemnity agreement executed,

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"[318] If the indemnity was a matter of concern only to the Government and the contractor, an exclusion such as that for damages caused by 'gross negligence, willful misconduct, or bad faith' of key employees would be undertandable as an attempt to assure safe performance. However, the effect of such an exclusion may be to make the protection of the public depend on the contractor's conduct. In the circumstances, it seems advisable to leave out such provisions. Safe operation can be assured through regulation by the Commission and the operator can be penalized for improper conduct by means other than denial of protection against liability. See Report, supra, note 288, at 8."

"[319] Report, supra, note 288, at 12. Under the bill all contracts would be covered except those entered into by the Department of Defense alone. It is contemplated that contracts with other Government agencies would be covered under sec. 170 (c) by virtue of the requirements of a license imposed on such agencies (ibid.). Contracts of the Commission or contracts financed in whole or in part by the Commission would be covered under subsec. (d)."

"[320] As in the case of licensed activities, the indemnity would cover the legal liability of all persons on account of each 'nuclear incident.'"

"[321] In the bill, the Commission's authority is restricted to 'contracts for the construction or operation of production or utilization facilities or research and development plants for the benefit of the United States.' Logically the Commission should indemnify contractors engaged in any activity for which proof of financial responsibility is required under the license program."

"[322] As noted above (note 319), all contracts except those entered into by the Department of Defense alone are covered under the Anderson bill. We understand that the Defense Department now has under consideration a bill to provide a statutory basis for granting indemnities to its contractors, and it may be that no additional provision in the Anderson bill will be required. It is important, however, that all contractors carrying on atomic activities should be treated uniformly."

the Commission will probably have few duties to perform. No insurance policies need be written by the Commission, and there is no fund to administer. If a fee is charged, the money received will be paid into the Treasury.[323] The chief duty of the Commission would be to require reports at appropriate intervals or otherwise determine whether the licensee is still able to satisfy the financial responsibility requirements.[324]

The problems of administration, in the event that a substantial accident actually occurs, promise to be more troublesome. For example, there must be an initial determination as to when the Federal Government will become involved. In the case of a borderline accident it may be difficult to determine whether the indemnity will ultimately be called into play. If it seems likely that the indemnity will be called into play, the Government should have some rights in the settlement and litigation of claims up to the point at which its interests will be directly involved.[325] A second major problem will be that of coordinating the activities of the Government with those of insurers and persons who may be liable. Claimants should be treated uniformly whoever may ultimately pay their claims. A third problem will be that of achieving rapid settlement of claims. Although the Government will have no obligation except where the persons indemnified are legally liable, the Commission should be authorized, on behalf of the Government, to settle claims prior to an adjudication of legal liability.[326]

The Anderson bill has a number of provisions designed to take care of these problems. Section 170 (h) gives the Commission power, upon a determination that the United States will probably be required to make indemnity payments, to collaborate with any person indemnified, to approve the payments of any claims, to take charge of any litigation, and to settle or defend any action. The section further provides that the Commission shall have "final authority on behalf of the United States to settle or approve the settlement of any claim on a fair and reasonable basis with due regard for the purposes of this act." [327] This provision gives the Commission the necessary power to protect the Government's interests in cases in which it may be called upon to make indemnity payments. It also gives the Commission power to pay any claim prior to an adjudication of the legal liability of a person indemnified.

Section 170 (g) of the bill provides that "the Commission shall use to the maximum extent practicable the facilities and services of private insurance companies and insurance adjustment organizations. * * *" [328] This provision appears to provide adequate authority for the Commission to establish a coordinated method of handling claims so that uniform treatment can be achieved. There are a number of questions which can be solved only by cooperation among the parties involved and some consideration might be given to the establishment, on a standby basis, of an integrated claims adjustment system, using the facilities of private insurers as a nucleus.[329]

"[323] An earlier version of the bill provided that 'all sums collected by the Commission * * * shall be made a part of and be merged with appropriations to be used by the Commission for research and development' (S. 3929, 84th Cong., 2d sess. (1956))."

"[324] The maintenance of the ability to satisfy the requirement of financial responsibility would be a condition of the license (report, supra, note 288, at 10). Since, in the event of an accident, the amount of insurance coverage provided by a syndicate policy would be reduced by the amount of any payments made (see, supra, p. 35), the Commission might have to require additional proof of financial responsibility. This question may be academic since it is not clear whether the Commission would permit continued operation in the event of a serious accident."

"[325] This is substantially the same problem as the problem of insurers writing excess coverage. The excess policy usually provides that the insurer shall have rights 'in the defense and control of any claim, suit, or proceeding which involves or appears likely to involve,' the excess insurer."

"[326] If prompt settlement is to be effected, the Government should have power to settle claims without waiting for an adjudication of liability in the case of any accident sufficiently serious that it appears likely that the indemnity will be called upon. The grant of this power does raise a question as to the rights of the insurer or the operator in the event that it is subsequently found that they would not have been liable for the damage caused. The best procedure would seem to be to get approval of all interested parties before payment; where this is not possible, the Government might make payments and settle the question of liability at a later date."

"[327] Sec. 170 (b), infra, appendix, p. 65."

"[328] Infra, appendix, p. 65."

"[329] Sec. 170 (g) of the Anderson bill would permit the Commission to pay for the services of private insurers. Consideration might be given to the development of special methods of adjusting losses to insure speedy relief. For example, an examination might be made of the feasibility of a system whereby partial payments could be made in cases where liability was clear but the amount of damage was in dispute. Admittedly such a procedure would be a radical departure from the usual method of claims adjustment, and might lead to protracted litigation. On the other hand, it might be justified in the case of a disaster, where a prime objective would be to get a community back on its feet."

As suggested earlier, the limitation on liability contained in the Anderson bill creates a number of special difficulties of administration. Unless recovery is to depend on the speed with which a judgment can be secured, some provision must be made for prorating available funds. Until claims are reduced to judgment, no one can know whether the limit on liability will be reached and, in the case of a serious accident, no settlement could be reached or judgment paid free from the possibility that the rights of subsequent claimants might be prejudiced. The likelihood that many personal injuries might not become apparent for a long time may make early determination of the total amount of claims particularly difficult.

We have indicated above that the amount of the indemnity should not be limited and consequently that a limitation on liability is unnecessary. If a limitation such as that incorporated in the Anderson bill is adopted, some provision must be made to handle the problems created in the event of a serious accident. The Anderson bill provides that the district court having venue in bankruptcy matters over the location of the accident shall have power, upon application, to issue "such orders as may be appropriate * * * including an order limiting the liability of the persons indemnified, orders staying the payment of claims and the execution of court judgments, orders apportioning the payments to be made to claimants, orders permitting partial payments to be made before final determination of the total claims, and an order setting aside a part of the funds available for possible latent injuries not discovered until a latter time." [330] Even with such wide power, it seems doubtful that any court can devise an orderly, speedy system for paying claimants.[331]

(*e*) *Summary of the indemnity program.*—An indemnity program incorporating the provisions suggested above would, together with private insurance, make possible the solution of the public liability problem of atomic industry.[332] It would have no effect on workmen's compensation liability [333] or the ability of atomic industry to meet the risk of damage to reactors or other atomic installations. We have made no recommendations for a Government program to deal with these latter problems, since it presently appears that, except to the extent that business interruption coverage is not offered, industry's problems will be solved within the framework of private insurance. If that expectation is not realized, the Government may need to take some action. It should be pointed out, however, that, with respect to damage to installations, the interests involved are quite different from those involved in the solution of the liability problem. Government action would have to be premised on the desire for sufficient industrial participation in the atomic energy program. Considerations of protecting the public would not be involved.[334]

With respect to the public, the indemnity program, plus the requirement of financial responsibility, should afford protection to the extent that there will be a financially responsible defendant to pay claims. Such a program will not, however, directly affect the public's ability to establish legal liability. While the assurance that the burden of paying claims will not fall wholy on private industry may have an effect on the willingness of courts to assess liability, many other

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[330] Sec. 170e, infra, appendix, pp. 64–65."

[331] As with claims adjustment, the centralization of litigation in a single tribunal would have great merit, even if a limitation on liability is not adopted. If the occasion should arise, it is hoped that a procedure would be worked out whereby centralization could be achieved."

[333] However, the possible liability of suppliers to the operator for damage to the installation is excluded from the coverage of the Anderson bill by sec. 11 (u), which excepts from the definition of public liability "claims for damage to property of persons indemnified which is located at the site of and used in connection with the activity where the nuclear incident occurs." Although no liability insurance is expected to be available to cover this liability, it nevertheless seems that this problem can be worked out by agreement between the operator, suppliers, and insurers, see p. 36, supra."

[333] The workmen's compensation liability of the operator to employees 'employed in connection with the activity where the nuclear incident occurs' is excluded from the coverage of the indemnity afforded by the Anderson bill (sec. 11 (u)). The basis for this exclusion is the expectation that such liability can be handled within the framework of workmen's compensation generally. However, the indemnity does cover subrogated claims of compensation insurers of other employers and even the subrogated claims of insurers for payments to employees of the operator not "employed in connection with the activity where the nuclear incident occurs." See report, supra, note 288, at 8. The Anderson bill would not seem to cover the case of a compensation insurer who has no subrogated right, see note 137, supra."

[334] If, however, workmen's compensation problems do not turn out to be solvable without aid from the National Government, considerations similar to those underlying the establishment of an indemnity program would be involved."

problems of the tort system will remain.[335] As we have indicated elsewhere, recovery is uncertain; litigation is expensive; and payment is frequently not made until long after the injury is incurred.[336] We turn, therefore, to a consideration of additional or alternative devices by which the public can be protected.

B. POSSIBLE ADDITIONAL OR ALTERNATIVE PROGRAMS

1. A program to offer direct insurance to the public

In the section devoted to outlining the problems of the public, reference was made to a wide variety of policies now offered by private insurers covering damage from conventional hazards. As was noted above, because of the catastrophe potential involved in large-scale atomic activities, there is at present grave doubt that private insurance coverage against radiation damage to property will be available to the public. The question may then be asked whether, in addition to an indemnity program,[337] the Government should offer direct coverage to the public or should take some action to strengthen the ability of private insurers to offer such coverage. Since there is at present no substantial demand for such coverage, any Government program of this sort would seem premature, at least until private insurers have had a better opportunity to consider to what extent it will be feasible for them to offer such coverage.[338] In any event, the program of private liability insurance and Government indemnity recommended above would provide substantial protection to the public against radiation damage to property. Unless it should turn out that that program does not provide reasonably certain and quick compensation for radiation damage to property, an elaborate program to offer direct property coverage to the public would seem unnecessary.[339]

2. Compensation plans

It has already been noted that radiation injuries pose a number of special difficulties for the tort system, such as the delayed manifestation of many injuries and the difficulty in certain cases of determining the source of the injurious exposure. Because of these problems, and also perhaps, because of dissatisfaction with the tort system generally, it has been suggested that a compensation plan [340]—based on an analogy to workmen's compensation—be enacted to cover radiation injuries to the public. In this report the merits and demerits of the arguments in favor of or against such plans cannot be discussed. The most that can be done is to examine the present feasibility of a plan to cover radiation injuries and point out some of the problems which must be faced by any compensation scheme.

Proposals for compulsory insurance plans to cover personal injuries are not unique to atomic energy. For years, there has been controversy in this country and elsewhere over the need to supplement or supplant tort liability by a system

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"[335] It can be hoped that as courts and legislatures become more familiar with the special problems of radiation injuries, steps can be taken to cope with some of the problems. One step that would seem particularly appropriate is the adoption of a uniform State law governing liability for radiation injuries. Enactment of a uniform statute by the States would seem preferable to the suggestion which has been made for a national tort law in this area. Tort law has traditionally been the province of the States and until a more urgent need is shown the best approach would appear to be to leave tort law for radiation injuries to the States. Consequently, as in other areas, we have not considered the question of the constitutionality of such a statute."

"[336] For an even more pessimistic view of the law of torts, see Mowbray and Blanchard, supra, note 124, at 149, where the authors state: 'At present the economic consequences of accidents are distributed, in theory, on the basis of fault; in fact, on the basis of chance, trading, and the relative resources of claimants, claimees, and insurers.' "

"[337] A program offering direct coverage to the public would have no effect on the liability problem since the public and their property insurers would have a subrogated right against atomic industry."

"[338] Even if private insurers decide that for the present such coverage cannot be offered, it may be that greater familiarity with atomic activities will demonstrate the feasibility of private coverage."

"[339] A voluntary program to offer coverage against personal injuries has not been considered since there is as yet no indication that such protection will not be available from private insurers to the same extent as against other hazards. Recently there have been proposals for a Government program to strengthen the protection against loss for personal injury afforded generally by private insurance. See message from the President of the United States, January 26, 1956, H. Doc. No. 230, 84th Cong., 2d sess. (1956)."

"[340] See Workshops on Legal Problems of Atomic Energy, supra, note 180, at 36, 42–43; Whaley-Eaton Service, The Atomic Radiation Hazard, vols. V, VI (1956). We use the term "compensation plan" because in the discussion of the problem in the atomic field that term has been used. If one accepts the argument (cf. 1 Larson, supra, note 137, at 13–22) that the term compensation should be restricted to a privately insured plan, the proposals in the atomic field might better be described as 'social insurance.' "

of social insurance or compensation.[341] The most familiar example of such a system is workmen's compensation, which has largely supplanted employers' liability. Analogous plans have been proposed to replace tort liability for automobile accidents,[342] and suggestions have also been made for a system to cover all accidental injuries.[343] With respect to these proposals and suggestions, there has been substantial disagreement over a number of questions. For example, should compensation benefits supplement or be in lieu of tort recovery? What is the proper method of financing such plans? What type of benefits should be awarded, and how extensive should they be?

As a prelude to our discussion, there are set forth here the main elements of a compensation plan for radiation injuries: (1) It would cover all radiation injuries regardless of the source of radiation and the time and place at which the injury is sustained; (2) it would be financed either by insurance taken out by users of atomic energy, as in workmen's compensation, or by a general tax; (3) it would provide defined benefits to persons suffering personal injuries; (4) it would be administered, not by a judge and jury, but by an administrative board.[344]

Because of the need for prompt action, the most important question, in the context of this report, is whether a plan covering radiation injuries is presently feasible. The answer to that question seems plain. There is simply not enough information available on which to base insurance charges, the amount of a general tax, or a proper system of benefits. Moreover, there does not seem to be any present justification for establishing an elaborate system to cover the general public. So far as is known, excluding bomb tests, there have been no cases of radiation injuries, other than to on-site personnel, which have resulted from the atomic energy program.[345] In any event, debate over the need for a compensation plan should not be permitted to delay prompt action on other measures. Past history in the fields of workmen's compensation[346] and automobile accidents[347] demonstrates that the tort system dies hard.

The fact that a compensation plan is not presently feasible does not mean, however, that careful consideration should not be given in the future to the possible establishment of such a system. If appreciable numbers of radiation injuries are not compensated under the tort system, another remedy may be essential. Assuming that the need for a compensation plan were to be demonstrated in the years to come, two major decisions to be made about such a plan would be: (1) To what extent should such a plan displace tort liability?; and (2) would a plan covering only radiation injuries be justifiable, or should radiation injuries be covered as part of a broader system?

At the outset, it should be pointed out that in the atomic field a compensation plan must cover property damage if it is to do away with the necessity of an indemnity to private industry. The great variation in property values makes the establishment of a workable compensation scheme for property damage

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"[341] See James, Social Insurance and Tort Liability: The Problem of Alternative Remedies, 27 N. Y. U. L. Rev. 537 (1952); Friedmann, Principles of Tort Liability and the Growth of Insurance, Internationales Versicherungs Recht (1955), p. 25."

"[342] The most comprehensive study of the 'compensation' idea for automobile accidents is contained in Columbia University Council for Research in the Social Sciences, Report by the Committee to Study Compensation for Automobile Accidents (1932) (hereinafter cited as Columbia Report). For later proposals and the subsequent history of the Columbia Report see Grad, Recent Developments in Automobile Accident Compensation, 50 Col. L. Rev. 300 (1950). A somewhat different approach is embodied in Ehrenzweig, Full Aid Insurance for the Traffic Victim (1954)."

"[343] For a brief discussion of plans covering all accidental injuries in other countries, see Friedmann, supra, note 341. For a proposal for a 'loss insurance' plan for accidental injuries in this country, see Green, The Individual's Protection Under Negligence Law: Risk Sharing, 47 Northwestern L. Rev. 751, 770 (1953)."

"[344] It should be noted that 6 States have workmen's compensation plans administered by courts, 2 Larson, supra, note 137, at 562–564. An additional feature of a compensation plan for radiation injuries is that tort defenses such as contributory negligence would not be available; the only defense would be that the injury was not caused by radiation."

"[345] See supra, note 94."

"[346] See Dodd, Administration of Workmen's Compensation (1936), chs. I, II."

"[347] Although the Columbia Report (supra, note 342) has been widely discussed and debated since it was published in 1932, the compensation idea has not been adopted in a single State. See Grad, supra, note 342, for a discussion of the recent history of the compensation idea for automobile injuries as well as a discussion of the plan adopted in Saskatchewan."

extremely difficult;[348] to our knowledge no compensation plan[349] in the atomic energy field or elsewhere has attempted to cover property.[350]

Even for personal injuries, there may be considerable question whether a compensation plan should wholly displace tort liability. The tort system is inherently more flexible than a compensation plan and it is possible, assuming that liability can be established, for an injured person to recover much more in a tort suit than as compensation benefits.[351] In England, where the question was given careful consideration, the possibility of abolishing the tort system was rejected.[352] The question as to whether the compensation and tort remedies should be alternative, supplementary, or exclusive, has been the subject of a great deal of discussion in other fields.[353] In the case of atomic energy, that decision cannot be made intelligently until there has been considerable more experience.

The second major question concerns the justifiability of a compensation plan covering only radiation injuries.[354] To a substantial extent the answer to that question will turn on the ability to differentiate between injuries caused by radiation and similar injuries resulting from other hazards. It would hardly justify the establishment of a compensation system if a substantial number of claimants might be denied recovery because they could not trace their injuries to radiation. Even if the differentiation could be made, there would remain the question whether there will be enough radiation injuries to justify a compensation scheme.

C. INTERNATIONAL ASPECTS

This study has been primarily concerned with the domestic atom and has given only incidental attention to the international aspects of the financial protection problem. Thus, the program proposed earlier is designed to give protection to the American public and atomic industry in connection with its domestic operations. But the program will have incidental international effects. To be adequate, the Government indemnity must cover industry's liability to residents of other countries who suffer loss as a result of an accident at an installation located in the United States. Similarly, protection of the American public requires that the indemnity given an operator cover the liability to the public of a foreign supplier.[355]

"[348] Even in the case of personal injuries, the problems of benefits become difficult outside the area of workmen's compensation where the variation in the income level of persons covered is relatively small. It has been pointed out that the burden on persons of relatively high incomes, if the tort remedy was abandoned, would be extreme. Ministry of National Insurance, Final Report of the Committee on Alternative Remedies, CMD 6860, par. 20 (1946) (hereinafter cited as 'Alternate Remedies')."

"[349] In Green, supra, note 343, at 771, the author suggests a 'compulsory comprehensive loss insurance * * * coupled with comprehensive accident insurance. * * * 'The author recognizes the great difficulty which would be encountered in such a scheme. As long as liability for injury to property is to be retained, the problems faced by any scheme would be similar to those faced by insurers in the atomic energy field. As we understand Professor Green's proposal, however, it would do away with liability for property damage in cases where direct coverage was obtainable."

"[350] Workmen's compensation does not, of course, cover damage to property. In the Columbia Report, supra, note 342, the problem of property damage was not considered. The authors pointed out that the problems of property damage were substantially different and, in the automobile field, less important. Similarly, the proposal in Ehrenzweig, supra, note 342, is restricted to personal injuries. Although in other cases, damage to property has been a lesser concern, in the case of atomic energy, the major damage done by a catastrophic reactor accident might be to property. See p. 19, supra."

"[351] See Alternative Remedies, supra, note 348, at 27. See James, supra, note 341, at 548. The inability to establish liability, or, if liability was established, to collect judgments, were major reasons for the adoption of workmen's compensation and proposals in the automobile field. Legal fees and other expenses of litigation may also reduce the disparity in net recovery."

"[352] See Alternative Remedies, supra, note 348, at 20. For a description of action in other countries with respect to the question of abolishing the tort remedy, see Friedmann, supra, note 341, at 38."

"[353] See James, supra, note 341. As indicated above (note 351) in the case of workmen's compensation, the prime moving force for a compensation plan was that under existing law, workmen seldom recovered damages. In the case of the automobile, one of the main original arguments was that persons rarely recovered damages from uninsured drivers. Perhaps the greatest argument today for a compensation plan covering automobile accidents is the burden on courts of the great volume of automobile accident litigation."

"[354] One substantial defect of present social insurance and private insurance schemes has been the emphasis on the hazards causing the loss rather than the fact of loss itself. Whether a continuation of the emphasis on selective coverage would best serve the needs of the public deserves careful examination."

"[355] The Anderson bill would seem to cover both situations: with two exceptions not pertinent here, the bill covers "any legal liability" of 'the person with whom an indemnity agreement is executed and any other person who may be liable' (sec. 11 (u), infra, appendix, p. 63)."

The proposed indemnity program does not cover radiation injuries to the American public from installations located abroad or the liability of American firms for accidents in foreign countries. There does not appear to be any serious danger, at present, to the American public from foreign operations; should the problem become serious, further action will probably be required.[356] The problem of atomic industry is already a serious one.[357] At the hearings on the Anderson bill, witnesses testified to the need for some program to cover American suppliers to foreign reactors, if the United States is to maintain a good competitive position in the foreign field. The Anderson bill, however, does not cover foreign operations and the decision to separate the foreign from the domestic issues seems wise. Whereas from a domestic viewpoint the justification for an indemnity program is based on a desire to help private industry participate in the development of atomic energy in the United States and to protect the American public against radiation injuries, the decision as to the establishment of a Government program for the foreign field may depend on quite different considerations.

The needs of American industry operating abroad require special study in the light of such factors as the availability of private insurance,[358] the local law in countries concerned, and the international agreements to which the United States is or may become a party. Again, a Government program to aid American industry should take into account, for example, general policies encouraging trade and investment abroad and the desire of the United States to help friendly countries in the development of their own atomic programs. But if special issues are raised by foreign operations, the considerations relating to the domestic problems which are discussed in this report should provide a significant background for a study of the foreign problem.

V. Conclusion

In accordance with its stated objectives, this report, after analyzing the financial protection problem, has undertaken to formulate a solution based on present knowledge. Because atomic energy is in its infancy, it may be expected that further development both of the atom and of ideas and methods for dealing with it will cast new light on many matters discussed in this report. It should thus be recognized that any program such as the one here proposed may have to be modified in the future. Obviously, nothing short of many years of experience with atomic energy will demonstrate how well this program together with the various elements of our existing system of tort law, private insurance, and social insurance, including workmen's compensation, can cope with the problem of financial protection against losses caused by radiation.

The need for action now is clear,[359] and an insurance-plus-Government-indemnity program of the kind suggested in this report would seem best to satisfy present needs. Such a program, making appropriate use of both private and public resources, would enable industry to participate in the development of atomic energy and at the same time give some assurance to the public that injuries suffered as a result of that development will be compensated.

The Chairman. Our next witness is Mr. Hann, of the National Association of Manufacturers. Will you come around, Mr. Hann?

"[356] In the report on the Anderson bill the Joint Committee states: 'If there is anything from the licensed activity, which causes injury abroad or if there is any activity abroad which causes further injury in the United States, the situation will require further investigation by the Congress at that time' (report, supra, note 288, at 9)."

"[357] See discussion of the activities of industry in the international field, supra, pp. 9–10. Action has been taken by some companies to obtain indemnities from foreign governments or the foreign operators of the installations (testimony of Weaver, Hearing, supra, note 104, at 108, 110–112). The United States now requires in each bilateral agreement that the foreign government hold the United States harmless. See 1 CCH Atomic Energy Report, par. 4502, p. 10091 (1956)."

"[358] Coverage of foreign operations is presently under consideration by the syndicates. Insurance is expected to be offered by the syndicates '* * * but on the basis of underwriting considerations of each individual risk with due consideration to the inspection facilities and controls available" (Heard, supra, note 216, at 98; see also Yount, supra, note 216, at 91)."

"[359] As to the need for early action, see letter of President Eisenhower, 102 Congressional Record 13887 (July 28, 1956); address of Chairman Strauss, supra, note 25, at p. 13643; and report, supra, note 288."

STATEMENT OF VICTOR A. HANN, ON BEHALF OF THE NATIONAL ASSOCIATION OF MANUFACTURERS

Mr. HANN. Thank you, sir.

The CHAIRMAN. You have a prepared statement I see, so you may proceed to read it.

Mr. HANN. I might say that the statement was prepared relative to the bills, S. 715 and H. R. 1981, before we were aware of the Commission's suggested redraft. I have gone over it briefly, but I do not think that the changes recommended by the AEC would affect our statement materially. However, if we have comments or suggestions after more careful examination we will submit a supplementary statement.

The CHAIRMAN. You may submit to the committee any suggestions you have.

(The material referred to appears at the end of Mr. Hann's testimony:)

Mr. HANN. My name is V. A. Hann. I am a member of the nuclear energy committee of the National Association of Manufacturers and am testifying today on behalf of that association. The NAM is a voluntary organization of approximately 21,700 members, both large and small, representing a wide cross-section of American industry.

The association is pleased to have the opportunity to appear before you in connection with the bills under consideration, S. 715 and H. R. 1981, introduced by Senator Anderson and Representative Price, respectively. The NAM did not testify at the hearings on governmental indemnity in the nuclear energy field which were held during the 84th Congress, because there was no stated association policy at that time to cover this area. However, the nuclear energy committee believed the problem to be of sufficient importance to warrant action during the first year of existence of the committee. At its second meeting, in September 1956, the committee recommended a policy statement covering financial protection against nuclear hazards, and the board of directors approved this position later in the month.

This policy position is relatively brief and I shall take the liberty of quoting it in full.

> Although the possibility of a catastrophic nuclear accident is small, the potential consequences are so serious they cannot be ignored. Unless industry can be assured of adequate financial protection against liability for damages resulting to persons and property in the event of such an accident, it may be impossible for private enterprise to proceed with a nuclear development program for peacetime purposes.
>
> Industry believes that the problem is urgent. The insurance industry has taken steps to provide insurance coverage many times greater than that normally furnished. However, legislation is needed to protect against liability which cannot be covered by insurance. While primary responsibility for safe design, construction, location, and operation of nuclear facilities should be placed no differently than is the case for other facilities, it is recognized that until further experience is had, governmental acceptance of excess liability on an indemnification basis appears to be a necessary interim step toward accomplishment of national objectives.

The Anderson-Price bills under consideration provide for governmental indemnification of licensees for public liability claims arising from nuclear incidents, as specifically defined in the legislation, in

excess of financial protection required from private insurance. The Atomic Energy Commission is given considerable latitude to determine the criteria as to the amount of private insurance coverage which will be required, basing such determination on—

(1) cost and terms of private insurance,

(2) type, size, and location of the licensed activity and other factors pertaining to hazard, and

(3) nature and purpose of the licensed activity.

The AEC is also authorized to enter into similar arrangements with its contractors for the construction or operation of production or utilization facilities or research and development plants for the benefit of the United States. Such arrangements may apply either to lump sum or cost type contracts. The aggregate governmental liability is set at $500 million per incident.

The NAM favors the Anderson-Price bills. We believe that one of the principal objectives of any legislation in this area is the coverage of the public from the claims arising from the potential hazards of a nuclear accident. The assurance that such protection exists would remove a serious roadblock which currently stands in the way of public acceptance of this new industry.

S. 715 and H. R. 1981 represent an excellent approach toward affording coverage of the public and we support these bills for that and other reasons and urge their early passage.

A question has been raised relative to the desirability of setting a dollar limitation on liability coverage, if the intent of Congress is to cover all public liability. However, $500 million is probably sufficiently large to cover claims that might result from a nuclear catastrophe. Should claims from a disaster exceed this amount, additional indemnification legislation would doubtless be passed based on the specific case. We further believe that it is, in general, not desirable to expose the Government to unlimited contingent liability. Therefore, we are essentially in agreement with the dollar limit expressed in the bills.

The NAM is also in favor of the provisions calling for private insurance carriers to provide coverage to the extent of their capability. As a business association, we are irrevocably opposed to Government entry into the insurance field when private insurance firms are ready and able to accept the liability. In this field, private insurance pools have been formed which will make available coverage substantially greater than that generally available for single risks. In fact, we understand that private insurance pools have stated a capability to provide public liability coverage of approximately $60 million per incident. A similar dollar amount of coverage probably will be available for coverage for property damage. Yet even this coverage falls short of complete coverage of liability, which has been estimated might result from a nuclear catastrophe.

The legislation under consideration requires a licensee to show private financial responsibility, deemed satisfactory by the AEC for the operation under consideration, before the indemnification provisions will become applicable. This provision is highly desirable, in our opinion, and should provide a good private insurance base, which may eventually, after more operating experience is gained be found to be sufficient in itself, without the need for governmental indemnity.

We further approve of the provision in the bills requiring the AEC to utilize the facilities of private insurance organizations in administering the terms of the bills. This provision would appear to give the AEC authority to work out a coordinated method for dealing with potential claims, so that a uniform procedure may be followed. Naturally, as has been stated before, we wish to have private enterprise encouraged and utilized in every way possible.

Although the NAM is in favor of the general approach of this legislation, we should like to set forth a few suggestions which, in our opinion, would strengthen the legislation and bring about greater certainty in protection for the public.

For example, section 170a of the legislation requires, as a condition of a license, that the licensee show financial responsibility of such type and in such amounts as the AEC deems necessary; this financial responsibility would apply with respect to licenses issued from August 30, 1954, to August 1, 1966. In section 170d the AEC is authorized to enter into similar agreements of indemnification until August 1, 1966, with its contractors for the construction or operation of production or utilization facilities or research and development plants for the benefit of the United States. We believe that it would be desirable to eliminate the differentiation between licensees and AEC contractors. Liability resulting from a nuclear incident in a contractor facility might be equally as great as that arising from an accident in a licensed facility. Therefore, we feel that arrangements for indemnification should be similar and the public be assured of liability protection in case of contractor and licensed operations both and that contractors should be required to show financial responsibility.

Then too, we are of the opinion that the language of section 170d as it applies to contractors leaves room for doubt as to coverage of subcontractors and suppliers. We also doubt the wisdom of limiting indemnification to contractors for production or utilization facilities or research and development facilities for the benefit of the United States. We feel that it should apply to all AEC contractors, subcontractors, suppliers, and any person whose activities involve substantial amounts of radioactivity, and that the language of the legislation should make it clear that coverage for these contractors should apply to existing contracts as well as those to be negotiated in the future.

Therefore, we should like to suggest possible language of section 170d which we believe would cover our comments (this starts on line 5, page 8 of S. 715):

In addition to any other authority the Commission may have, the Commission shall until August 1, 1966, enter into agreements of indemnification with its contractors, subcontractors, and suppliers, such agreements to apply to contracts currently in being, as well as those entered into in the future.

There also should be some changes of "may" to "shall" to remove the permissive aspect further along in that same section.

We think that the above points are of such a nature that they might be considered in connection with the legislation as it now stands. There are a few other general points in this area which we should like to mention at this time; we believe they are worthy of review, but we do not think they are of such a nature as to delay passage of S. 715 and H. R. 1981 in essentially their present form.

(1) As time goes on, there will doubtless be more and more nuclear reactors built under Department of Defense contracts or contracts with other Federal agencies. Contractors, subcontractors and suppliers for the Department of Defense and the other agencies would be subject to liability in precisely the same manner as are AEC contractors and licensees. Under the Anderson-Price bills as they now stand, no provision is made for indemnification coverage of Department of Defense contractors. In our opinion, serious consideration should be given toward remedying this situation.

Incidentally, we understand that a proposal incorporating indemnification for "unusual hazards" is now under consideration by the Department of Defense.

(2) The Anderson-Price bills specifically define a nuclear incident as one occurring within the United States. There is no provision for liability coverage with respect to products supplied on the international market, or for a nuclear incident taking place in a nuclear-powered vessel of United States registry in a foreign port. We believe that this is another problem which will develop as nuclear programs abroad commence to expand and as the maritime tanker and freighter fleet becomes nuclear-powered.

In this connection, we are pleased to learn that the AEC and the Maritime Commission already have this problem under consideration.

In conclusion, we should like to state that we are in favor of the legislation under consideration, and urge its passage in essentially its present form. We believe that certain modifications would strengthen it and make the coverage broader. However, the intent of the Anderson-Price bills is highly commendable and passage of this legislation would remove a serious roadblock currently standing in the way of development of civilian nuclear energy programs. Therefore, we recommend that S. 715 and H. R. 1981 be favorably reported out of the committee and passed by both Houses of Congress at an early date.

The CHAIRMAN. Thank you very much, Mr. Hann.

Mr. Cole?

Representative COLE. I have no questions.

The CHAIRMAN. Mr. Jenkins?

Representative JENKINS. I have no questions.

The CHAIRMAN. Thank you very much for your statement, Mr. Hann.

(The supplementary statement referred to on p. 183, follows:)

NATIONAL ASSOCIATION OF MANUFACTURERS,
New York, N. Y., April 5, 1957.

Hon. CARL T. DURHAM,
Chairman, Joint Congressional Committee on Atomic Energy,
Congress of the United States, Washington, D. C.

DEAR SIR: In response to your invitation during my testimony of March 26, 1957, on S. 715 and H. R. 1981, I am pleased to submit NAM's comments relative to the Atomic Energy Commission's suggested redraft of these bills. As I stated when I appeared before your commitee these changes are, in general, clarifying in nature and for that reason they do not affect our basic position on these bills. With the few exceptions noted below, we are essentially in agreement with the AEC's revised version of the bills.

We should like to offer the following specific comments on the AEC's recommended changes:

SECTION 3

Section 11j

The expanded and clarified definition of "financial protection" is desirable, but we are puzzled as to the reason for specifying "insurance * * * available from private sources of the United States market." It is our understanding that the insurance pools are to include reinsurance commitments from foreign sources. Therefore, the apparent exclusion of insurance from such sources is somewhat confusing and, perhaps may require clarification.

Section 11l

We believe that an expanded definition of "indemnity" and "indemnification" is desirable, and feel that the AEC's wording is satisfactory.

Section 11o

We understand the desire of the AEC to confine the scope of the legislation to activities deemed to be particularly hazardous, hence the exclusion of source and byproduct material licenses from this definition. We are in agreement also with the stated opinion of the AEC that financial responsibility for such hazardous activities be mandatory rather than permissive. Nevertheless, it is our feeling that the definition of licensed activity as it appears in the bills is preferable. Later sections of the bills (both original and redrafted) further clarify the financial responsibility requirements, making them less rigid for less hazardous operations. It is our opinion that the original language of the bill is preferable and should be retained.

Section 11p

The refinement of the term "nuclear incident" appears desirable.

Section *11v*

The deletion of the last sentence of this section represents a perfecting amendment, inasmuch as the provisions appear elsewhere in the redrafted bill.

SECTION 4

Section 170a

In general, the proposed additional language is favorable since it serves to clarify this section. Nevertheless, the question again arises as to the desirability of excluding source and byproduct material licenses. We agree with the AEC that operations involving source and byproduct materials constituted a relatively remote hazard. Yet, we stated above, we belive that it would be preferable to include a provision for financial responsibility in connection with such licenses in language similar to that appearing in the original draft of the legislation.

We see no objection in the requirement that hazardous operations involving special nuclear materials should show financial responsibility, as the AEC recommends. However, we believe that the AEC's discretionary power for requiring proof of financial responsibility as a condition of licenses issued for source and byproduct materials should be kept. For operations considered to be nonhazardous, financial responsibility may or may not be necessary at the AEC's discretion.

In brief, we believe that the language of section 170a should be modified as follows: "At any time within 10 years of the date of enactment of this section each license, except those issued for the export of production or utilization facilities under terms of an agreement for cooperation arranged pursuant to section 123, and those issued to an agency of the Federal Government, issued under sections 103 and 104; each construction permit issued under section 185; and each license under section 53 where the licensee is licensed to have in his possession sufficient quantities of materials to constitute, in accordance with criteria which the Commission shall establish in writing, a hazard involving bodily injury to others than employees of the licensee or widespread property damage to property not controlled by the licensee from a nuclear incident; and each such license issued between August 30, 1954 and the date of enactment of this section shall, *and other licenses issued under section 53 and each license issued under section 63 or 81 may*, have as a condition of the license a requirement that the licensee have and maintain financial protection of such type and in such amounts as the Commission shall require in accord-

ance with subsection 170b to cover public liability claims. * * * " (Our additions are italicized; otherwise the language conforms to the AEC redraft.)

The delections in section 170a are perfecting amendments since the same language appears in another section of the bill.

Section 170b

Again we note the AEC has specified that the amount of financial protection required shall be the amount of liability insurance available from private insurance sources "of the United States market." As indicated above, we are somewhat puzzled by this limitation. As a practical matter, the wording will probably not pose problems, or lessen the available coverage; nevertheless, we question the desirability of this apparent limitation.

The AEC has recommended deletion of "cost and terms of private insurance," as one of the criteria in determining the amount of financial responsibility required. This change seems desirable since we agree with the Commission that it would be put in a position of passing judgment on private insurance rates which are established only after approval by appropriate State regulatory agencies.

The AEC has also recommended deletion of "type" of licensed activity from the second criterion. We do not agree with this revision, for it appears to us that the type of a licensed activity must be considered, together with its size and location, in the determination of financial responsibility. Some types of activities will doubtless be more hazardous than others, regardless of the care exercised to incorporate special safety features.

In our opinion, insertion by the AEC of language to cover temporary protection in the event of reduced insurance coverage by reason of loss or other expenses is necessary. Since it is apparent that the Anderson-Price bills are designed to cover public liability at all times, we are of the opinion that this addition is virtually required in order to remove what might develop into a serious loophole.

Section 170c

The changes here suggested by the Commission clarify the intent of the section and are thus desirable. As the AEC points out, this legislation is designed to cover all indemnified parties, but there are certain ambiguities in the original legislation which the language changes go far toward clarifying.

We further believe that the AEC properly included a provision to take into account those claims filed subsequent to the period for which private financial coverage is available.

Section 170d

In connection with this section I should like to refer to my statement prepared on this legislation. As you will recall, the NAM recommended that the Commission be required to enter into agreements of indemnification with its contractors and subcontractors and that these persons should be required to show financial responsibility. We note that the AEC suggested no modification in the permissive aspects of this provision. We remain of the opinion that this is a necessary change in the legislation and that it should be made, in addition to other changes recommended by the AEC.

We are pleased that the AEC has included contractors, subcontractors and suppliers within the terms of section 170d. As indicated in our oral statement, we believe this is a desirable amendment.

Section 170f

In our opinion, the AEC has clarified this section, by specifically making provision for fees both for reactor and other types of operations. We believe that the fees for indemnity coverage should be nominal and should cover administrative expenses only. We also feel that such fees should not be used to build up reserves to cover possible indemnity payments. We beileve this was the intent of the Anderson-Price bills, and see no objection to the changes proposed by the AEC, since they apparently succeed in bringing about refinements in language.

We have no comments to make regarding other proposed alterations suggested by the Commission in subsequent sections of the bill.

As previously stated, the NAM supports the general principles of the Anderson-Price bills. We believe that both the Joint Committee and the AEC have done a highly commendable job in drafting legislation which is essential for

the removal of a serious roadblock in the civilian nuclear energy program. In fact, we feel that the need for legislation in this area is sufficiently urgent, that early enactment of the Anderson-Price bills in essentially their original form is preferable to delays brought about through efforts to perfect some of the provisions. We appreciate the opportunity afforded us to express our views both in person and through this correspondence on this legislation and hope that our comments will assist the Committee in its deliberations.

We should like to request that these comments be made a part of the record of the hearings relative to this legislation.

Respectfully submitted.

VICTOR A. HANN,
Nuclear Energy Committee.

The CHAIRMAN. The committee is adjourned until tomorrow morning at 10 o'clock in the House Armed Services Committee room, room 313.

(Thereupon, at 3:50 p. m., Tuesday, March 26, 1957, a recess was taken, until Wednesday, March 27, 1957, at 10 a. m.)

GOVERNMENTAL INDEMNITY AND REACTOR SAFETY

WEDNESDAY, MARCH 27, 1957

CONGRESS OF THE UNITED STATES,
JOINT COMMITTEE ON ATOMIC ENERGY,
Washington, D. C.

The committee met, pursuant to recess, at 10 a. m., in room 313–A, Old House Office Building, Representative Carl T. Durham, of North Carolina (chairman of the joint committee) presiding:

Present: Representatives Durham, Price, Cole, Van Zandt and Kilday; Senator Anderson.

Also present: James T. Ramey, executive director, George Norris, Jr., committee counsel, and Georege E. Brown, Jr., David R. Toll, Hal Hollister, professional members of the staff.

The CHAIRMAN. The committee will come to order.

This is a continuation of the hearings on H. R. 1981 and S. 715. This morning we have Mr. Stoddard Stevens, of Sullivan & Cromwell of New York.

Do you have a statement Mr. Stevens?

Mr. STEVENS. Yes, sir; I have.

STATEMENT OF STODDARD STEVENS, PARTNER, SULLIVAN & CROMWELL, NEW YORK, ACCOMPANIED BY GEORGE C. KERN, JR.

The CHAIRMAN. Thank you. You may proceed.

Mr. STEVENS. My name is Stoddard M. Stevens and I am a member of the law firm of Sullivan & Cromwell, of New York City. I appreciate very much the invitation of the committee to appear at these hearings on indemnity legislation. Since I had the privilege last year of participating in the committee's advisory seminar on this problem and of testifying twice during the course of the hearings last year on the Anderson-Price legislation, and as I have been advised by the staff that such comments would be in order, I should appreciate the opportunity at this time, if agreeable to the committee, of presenting a statement with respect to the international aspects of the atomic energy liability problem.

Although the invitation of the committee was directed primarily to comments on the legislation introduced at this session in the Senate by Mr. Anderson, and in the House by Mr. Price, I presented my basic views on this legislation last year and at this time desire only to express my support of this legislation and my hearty congratulations on an effective job of draftsmanship in a very complex area. A few suggestions on several points of the Anderson-Price legislation are presented at the end of my statement.

While separation of foreign and domestic phases of the insurance and indemnity problems may be desirable as a matter of legislative

draftsmanship, I respectfully suggest that activity on the foreign phase might properly proceed simultaneously with that relating to the domestic phase.

The economics of the nuclear energy industry and the impetus afforded by the Government's "Atoms for Peace" program make it probable that at least in the immediate future the domestic atomic industry can find a prime market beyond the borders of the United States. A solution to the liability problem appears as a vital step toward full development of the potentialities of this market and the furtherance of the national objectives of United Staes leadership and encouragement of atomic activity in friendly foreign nations.

That both the Government and private industry have a growing interest in the development of United States participation in foreign atomic energy activity is evidenced by many recent developments, such as the report of the Atomic Energy Commission in the section 202 hearings held only a few weeks ago that 43 bilateral agreements had already been negotiated and that power bilateral agreements were then being negotiated with 17 nations. Almost daily the press carries reports of increased foreign activity in the atomic energy field, such as the recent visit to this country of representatives of the Euratom group.

Although United States nationals could conceivably incur liability to residents of foreign countries for damages resulting from atomic installations in the United States and although participation by United States nationals in atomic activities abroad may take many forms, ranging from research through design to the supply and operation of facilities, it appears likely that the most significant activity by United States nationals in these foreign markets will be in the supply of equipment. I should like here briefly to summarize the more extended consideration of the specific legal problems facing the domestic equipment supplier when he sells his product abroad contained in a supplementary statement which I respectfully request the committee's permission to submit with my testimony here.

Claims against a United States manufacturer for a foreign atomic incident could stem from two primary sources: third parties injured as a result of the incident, and the foreign customer. It is probable that injured third parties would seek recovery in the first instance against the foreign operator; but if the latter's assets were insufficient to meet the claims, the injured third parties might seek recovery against the United States manufacturer on a negligence theory either in foreign courts or in the courts of the United States. The foreign customer might seek recovery against the United States manufacturer by way of recoupment for third party claims to which he has had to respond and he might also seek recovery against the manufacturer for damage caused to his own property; the customer's complaint could be founded either in tort or contract, depending upon the circumstances. It seems entirely clear that in many situations the foreign claimant would have access to the United States courts for purposes of suit against the United States manufacturer directly; in addition, in many situations a foreign judgment could be enforced by United States courts.

As more fully explored in my supplmentary statement, the United States manufacturer of atomic equipment doing business abroad faces peculiar practical and legal difficulties: insurance coverage is at this

time uncertain; the substantive rules of liability to which he would be subject vary from country to country and depend in part upon the application of complicated rules of conflicts of laws; the right of recovery by the manufacturer against the customer if the manufacturer is required to respond in damages to a foreign third party claimant is subject to the varying rules and procedures of foreign jurisdictions.

The present solutions available to private United States industry in the absence of any governmental or international action appear of limited effectiveness. The availability of insurance is uncertain and, even for domestic operations, insurance has been seen to be inadequate as a full solution to the problem; hence the Anderson-Price proposals. The United States manufacturer could seek contractual indemnity from the foreign customer. However, considerable reluctance has been encountered on the part of both foreign governments and foreign corporations to grant indemnity.

Furthermore, as foreign nations start to close the gap in reactor technology, United States producers could find themselves at a competitive disadvantage if they were to insist on indemnities while foreign producers, possibly under the protection of domestic legislation, were not.

Also, some foreign governments encounter some of the same problems faced by the United State Government in granting indemnity with possibly open-ended financial reponsibility; these problems stem from the legal bars to committing governmental funds in the absence of or in excess of legislatively appropriated funds. Even if indemnities were to be granted, there would remain the uncertainties of interpretation if these clauses were to be governed by the laws of foreign jurisdictions. All things considered, it seems that some sort of international arrangement affords the most immediately available feasible solution.

It is international action which is, of course, contemplated by the recent legislation introduced by Mr. Cole in the House. I mentioned this type of relief in my testimony before this committee on June 14, 1956. To my knowledge, this is the first legislation aimed at the international phase of the liability problem. As I understand Mr. Cole's proposed bill, the Commission would be required in each bilateral agreement, pursuant to section 123 of the Atomic Energy Act of 1954, to include an agreement by the foreign nation to hold harmless against public liability claims any United States national furnishing services, materials, facilities, component parts or other parts and equipment pursuant to an Agreement for Cooperation.

It seems to me that Mr. Cole's suggestion affords a fruitful line of approach to this problem. Since almost any power reactor sold by a United States supplier would probably involve the use of special nuclear material furnished by the United States, the technique of providing for indemnity by way of the bilateral agreements would provide protection to the United States industry at the point where it is most needed.

Mr. Cole's bill apparently contemplates absolute indemnification of the American supplier regardless of negligence. Since foreign nations might be reluctant to grant a ground-up indemnity extending to negligence, it might be desirable to consider linking the manufacturer's

responsibility for negligence with the available insurance coverage. Thus, if there were incorporated into the Cole bill something analogous to the Anderson-Price insurance provision, the foreign government would not be indemnifying American suppliers for all claims based on the latter's negligence and at the same time the American manufacturer would have the protection of indemnity against the risks not covered by available insurance.

The proposal contained in H. R. 5694 imposes a responsibility on the foreign government in excess of that proposed for the United States Government under the Anderson-Price legislation. Since any sale of a power reactor and the supply of special nuclear material therefor would probably require a specific contract to be entered into under the Agreement for Cooperation, it might be possible to introduce into section 123 the theory of the Anderson-Price legislation with respect to coverage of a certain amount of liability by private insurance.

For example, it might be provided in section 123 that the foreign government's indemnity would cover liability in excess of an amount of insurance which would be determined as reasonable at the time of negotiation of any specific contract pursuant to the Agreement for Cooperation. Or, in lieu of an indemnity by the foreign government, there might be provided a limitation on suppliers' liability above the amount of insurance determined to be reasonable. Such a technique would permit the Atomic Energy Commission to make the same type of determinations as contemplated by subsection a of section 170 as contained in S. 715 and would not necessarily require the creation of an international fund to meet claims since each government could, as a matter of domestic action, determine how much it would make available to its own citizens in the event of a nuclear incident involving claims in excess of the insurance coverage.

If for any reason, such as possibly a reluctance to introduce the indemnity clause as a condition precedent to the obtaining of special nuclear material by a foreign government or the legal difficulties under the domestic law of certain foreign nations presented by an executive agreement with open-end financial responsibility, the use of section 123 bilateral agreements as a method of meeting the indemnity problem should be considered inadvisable, there might be considered other alternatives such as separate bilateral executive agreements or treaties, multilateral treaties with a few foreign governments, or a multilateral convention including many foreign governments. I have explored some of the legal problems which might be met in the formulation of an international agreement dealing with the indemnity problem in my supporting statement.

Because of the enormous technical and mechanical problems involved in a multinational convention of any type, I suggest that the bilateral approach, be it by way of bilateral agreements under the Atomic Energy Act or by way of separate bipartite treaties or agreements, affords the possibility of a more prompt alleviation of the present difficulties. Since the opportunities for United States participation in foreign atomic energy activities are present at this very moment, the delay which would be inevitable in the drafting and ratification of a treaty involving many nations may not be the best solution for the short run. Possibly a series of bilateral agreements

with a few foreign nations where major atomic activity might be centered in the immediate future could serve as a temporary stopgap pending the effectiveness of a multinational convention.

It occurs to me that there is a relationship between the Anderson-Price legislation and the foreign aspects of the liability problem. Passage of domestic legislation providing indemnity by the United States Government to its nationals engaged in atomic energy affairs should certainly provide a stimulus to a similar action by foreign governments. Even if the foreign governments do not adopt domestic legislation of the Anderson-Price type, the existence of United States legislation should provide a firm basis for negotiation of an indemnity provision in the section 123 bilateral agreements or in separate international agreements or treaties.

As a final thought, might I suggest that the problem of the atom-powered merchant ship also deserves consideration in connection with any international arrangement on the liability problem. Since the limitations on liability imposed by the Admiralty law do not in general apply to the manufacturer of vessels or component parts thereof, the manufacturer of atomic equipment for vessels may be peculiarly exposed to third party liability claims. If an injured person were to find himself precluded from recovering from the vessel owner or operator because of the liability limitations of Admiralty law, he might certainly try to recover from the manufacturer of a component or the shipbuilder if he could find any basis for a claim of negligence. It might be desirable to consider a separate international convention with respect to atom-powered vessels. Such a convention might include indemnity and liability limitations of the type suggested in my supplementary statement in connection with international arrangements dealing with land-based reactor installations.

Returning for just a moment to the Anderson-Price legislation, there are just two points of clarification with respect to S. 715 and H. R. 1981 which I would like to propose for your consideration.

I am not sure that section 170c in its present form makes it clear that the indemnity applies to any nuclear incident occurring prior to the expiration of a license, regardless of when the claim may be made. I suggest that the last sentence of subsection c read as follows:

> Such a contract of indemnification shall cover public liability arising out of or in connection with the licensed activity as a result of nuclear incidents occurring during the period of the license.

I might note that the words "occurring during the period of the license" appeared in subsection c of section 170 contained in S. 4112 as section 4 as reported out of the committee last year.

Also in subsection c, since the "persons indemnified" may not all be covered by the "financial protection" required by subsection a, it would seem desirable to insert after the word "required" in line 3 of page 5 something along the lines of the following parenthetical clause:

> (except in the case of persons indemnified who are not covered by the financial protection required pursuant to subsection a, in excess of the amount of insurance payments applicable to such persons on account of public liability arising from nuclear incidents).

The second point of clarification is with respect to subsection d of proposed section 170. It seems to me that lines 19 through 21 should

be consistent with the similar clause in subsection c. I therefore suggest that lines 19 through 21 on page 5 be changed to read as follows:

activity, and shall indemnify and hold harmless the contractor and other persons indemnified, as their interest may appear, from public liability arising from nuclear incidents which is in excess of the amount of financial protection in the amount of $500 million.

Also, there might be considered the insertion of the parenthetical clause suggested above after the word "required" in line 21, in order to cover the point that the required financial protection might not cover all the persons indemnified.

Mr. Chairman, that concludes my prepared statement this morning, and what follows in the pages I read is the supplementary material which I ask leave to have incorporated in the record.

The CHAIRMAN. Thank you very much, Mr. Stevens. The supplementary statement will be inserted in the record at this point.

(The statement referred to follows:)

SUPPLEMENTARY STATEMENT OF STODDARD M. STEVENS

The problem of financial protection of United States nationals engaged in the atomic industry in foreign activities in the broadest sense involves possible liability of United States industry to residents of foreign countries for damages resulting from installations in the United States or from those located in foreign countries and the protection of United States nationals against damage caused by foreign nationals from installations located either abroad or in the United States. However, because the other phases of the problem are susceptible of solution, albeit not without difficulty, by unilateral action in the United States and because it appears as the most immediately pressing concern, I wish to focus my remarks on the problems of the United States atomic industry arising from operations conducted in foreign countries.

Participation by United States nationals and corporations in atomic activities abroad may take many forms: research and development work; design and engineering services; the sale of radioactive isotopes; operation of facilities; and the supply of equipment. Since it is the supply of atomic equipment which will probably involve most intensively the largest number of domestic atomic participants, I shall center my attention today primarily upon the problems confronting an equipment supplier.

As is the case in the domestic market the equipment supplier to foreign activities will not generally be an operator of the facilities he supplies. In the usual case, the United States manufacturer will relinquish title f. a. s. at some United States port. Although he may participate to varying degrees in the installation, inspection, and starting up of the facility abroad, control of the operation will, in the usual situation, be essentially the responsibility of the foreign csutomer.

Until relatively recently in this country the contractor installing heavy equipment on a customer's premises has not been held liable for injury or damage to persons or property of third parties where title and operational control has been exclusively in the customer. However, in some recent cases the contractor has been found liable to third parties in situations where his negligence has been established as the cause of the injury or the damage. The substantive rules of an equipment supplier's liability under the domestic law are embraced within what is generally referred to as the law of product liability. Another source of liability for the equipment supplier is the recourse which the customer might have against him on a contract theory such as breach of warranty. Although the equipment supplier has not been held liable in suits by third parties except where his negligence has been established, the imposition of absolute liability on the operator of an installation could result in the latter's obtaining recovery against the supplier if the latter is found to have breached his contract with the customer.

With respect to his liability problem, the United States manufacturer engaging in atomic activities abroad is faced with legal and economic complexities not met when he sells his equipment in the United States. Although some

domestic insurance sources have considered coverage of foreign operations, the availability of such coverage appears not nearly as imminent as coverage of domestic operations. Although there are recent reports of the organization of syndicates for insurance for these risks in various European countries, the extent of coverage is uncertain and it is not known whether all of these resources will be available to United States manufacturers or whether they will be limited to foreign suppliers and operators. Even if insurance were to be available from domestic sources, it is not unlikely that the premium would be considerably higher for foreign coverage for several reasons: The safety controls of the Atomic Energy Commission do not have the same applicability; the varying standards of liability could expose insurers to greater and uncertain risks; and the subrogation rights of domestic insurers are varying and uncertain.

Turning to the legal complexities, at the outset the supplier of atomic equipment to foreign customers is confronted by the question of what rules of liability are applicable to his activities abroad. The answer to this question depends upon both the determination of the jurisdiction the law of which will be applicable, and the substantive rules of liability of that jurisdiction. Even if it is clear that under most circumstances the applicable law would be the law of the place where damage is incurred, it is possible that multiple jurisdictions would be involved, since in certain areas of the world, particularly in Europe, a single nuclear incident could conceivably cause damage in numerous jurisdictions. But it is also possible that even if the substantive rules of liability of the place where harm is sustained would govern, reference might be made to pertinent United States safety regulations and standards as evidence of the standard of care against which the defendant's action or inaction would be measured in determining negligence. Recognizing the possibility that the American manufacturer might have applied to his activities the laws of any number of foreign jurisdictions, the possible rules of liability to which he might be subjected vary almost as widely as the possible number of jurisdictions: the laws of some nations include a general principle of liability for injuries or damages caused by dangerous instrumentalities, others by any object whether dangerous or not ;others lay down only a presumption of negligence, while still others impose a standard of semiabsolute liability with only a limited number of defenses allowed. For example, in France, in addition to the general theory of liability for fault, the law speaks of an objective responsibility which is a liability without fault imposed for damage caused by an inanimate thing. This concept of liability is in essence a presumption of liability placed on the person who has a thing in his care. The Cour de Cassation has concluded that this presumption can be rebutted only by proof of a fortuitous event of force majeure. On the other hand, in Scandinavia, the main principle of the law of torts is the principle of fault. Although the situation varies among the Scandinavian countries, the development toward the imposition of strict liability does not appear to have gained as much ground as in other European countries. In Yugoslavia, absolute liability for various types of industrial activity is imposed by statute.

The scope of an American supplier's liability is not limited to the possibility of suit in a foreign country directly by a third party. Depending upon the circumstances, the American manufacturer faces suit either in this country or in a foreign country if he is amenable to jurisdiction and has assets there; likewise he might be sued either by a third party claimant or the foreign customer. Even if under the laws of a particular jurisdiction the doctrine of manufacturer's product liability is not recognized, the United States manufacturer could, in some situations, be sued by the foreign customer either abroad or in the United States. Also important in evaluating the scope of liability is consideration of whether the United States supplier, where he is required to respond in damages to a foreign third party claimant, can in return seek recovery from a customer who may possibly have been responsible for or contributed to the incident giving rise to the liability. Here, he may have the right to claim contribution either on the basis of the contract existing between the customer and himself, or on the theory of contribution between joint or concurrent tort feasors. Entirely different sets of rules may apply depending upon whether the action lies in tort or in contract and even the determination of the applicable law may hinge upon such distinction. Just as an example of the complexities involved, many legal systems allow contribution among joint tort feasors whereas many of the States of the United States forbid action between such persons. Still other jurisdictions refuse recourse action to persons who have

been found guilty of a criminal offense even if that offense takes the nature of some minor misdemeanor.

Further uncertainty is injected by the fact that the criteria determining the categories of recoverable damages and the measures of damages vary greatly from country to country. Some laws allow compensation for grief, while others do not; in some jurisdictions funeral expenses may be recovered and in others they cannot; some countries give a right of compensation to a decedent's estate whereas in others the right of action is limited to the next of kin; some laws forbid the deduction of insurance moneys collected as a consequence of death, while others do deduct such amounts; at least in one country damages are allowed only in the event that the claimant would, due to the loss of support, no longer be able to maintain the same standard of living.

In the absence of Federal legislation or international agreement there are but limited and unsatisfactory avenues available to the United States manufacturer for securing financial protection against foreign risks. First, he can utilize whatever private insurance resources are available. Even for domestic operations, available insurance protection has not been considered adequate, in view of the scope of potential liability peculiar to this industry: hence, the proposed Anderson-Price legislation. Secondly, he can seek indemnity from the foreign customer. The indemnity route poses problems of both an economic and legal nature. The obtaining of a comprehensive indemnity clause depends in part on the relative bargaining positions of the parties. Foreign customers have exhibited considerable reluctance for both practical and legal reasons to grant indemnities. Even if obtained, the effectiveness of such contractual provisions in many instances would be subject to the uncertainties of foreign law and foreign legal procedures. Where the foreign customer is a government, additional complications by way of statutory or constitutional restrictions may be encountered. Thirdly, with respect to possible recourse claims by the customer, the manufacturer can try to limit his liability by the terms of his contract. However, the effectiveness of a contractual provision limiting the manufacturer's liability to damages to the installation would be subject to some uncertainty if, under the applicable conflicts rules, the interpretation of a given contract were to be held governable by the laws of a foreign jurisdiction. The manufacturer can attempt in his contract to make the laws of a particular jurisdiction applicable, but even with such a provision uncertainties could arise if a court were to find too many of the contractual incidents taking place in some other jurisdiction.

If the private measures available to the United States manufacturers for protection against foreign risk are inadequate, there remains the possibility of governmental action. This action could conceivably take the form of unilateral United States legislation, or international agreements. International agreements in turn might take the form either of a convention to which many nations would be parties, a more limited international convention involving relatively few nations, or a series of bilateral agreements between the United States and other countries.

As for possible unilateral United States action, there at least might be considered the possibility of abolishing the cause of action based on foreign nuclear incidents or eliminating the jurisdiction of State and Federal courts over suits arising from such incidents. If the jurisdiction of the United States courts is to be denied, this limitation would also have to be applicable to the enforcement of foreign judgments. Here we are confronted, on the one hand, with the constitutional problems arising from Federal action which would affect the substantive rules of law and the jurisdiction of State courts and, on the other hand, with problems of international comity which would result from the denial of access to the United States courts to foreign nationals. Any consideration of unilateral action will have to take account of the origin of the right of foreign nationals to sue in United States courts. Among the sources of this right are numerous treaties of friendship between the United States and other countries which grant reciprocal rights to the nationals of each with respect to access to courts; the 5th and 14th amendments to the United States Constitution, the benefits of which have been held to extend to aliens; and the provisions of the Federal civil-rights bill which grant to all persons within the jurisdiction of the United States the same right to sue as white citizens, which provisions have been held to extend to aliens.

In the absence of international action, no legislation adopted by the United States alone would safeguard the United States manufacturer having assets

abroad. It would require more than United States legislation to protect these foreign holdings from a levy in execution of a foreign judgment. Of course, if satisfaction of claims of foreign nationals were limited to foreign-held assets, the potential liability of a United States manufacturer would be limited to that extent.

Turning to the international agreement approach, although some practical and legal differences will be encountered depending upon whether one is considering a many-nation convention, a limited convention or a bilateral treaty, the principles and problems which I propose to outline will be generally applicable to all these alternatives.

Ideally, the general objective of any such international agreement would be to define, limit, protect and standardize the rights of persons who cause or sustain property damage, personal injury or death caused by atomic installations. There are advantages to an international convention both from the point of view of the person who may attempt to recover for damage and from the point of view of the reactor operator or equipment supplier. Such a convention could aleviate the present problems confronting the plaintiff, among which are difficulties in obtaining jurisdiction over the defendant, difficulties which attend the bringing of an action, where necessary, in a foreign court, the possible unavailability of assets or insurance in the hands of the defendant sufficient to cover the claim and the involved problems of conflicts of laws and international law. At the same time such a convention would ease the problems of the atomic industry arising from the varying and uncertain liabilities which change from country to country and whenever legislation or case law in a particular country is amended.

The first major area of concern in considering the international convention would be the principles of liability to be imposed. A consideration of this problem would necessarily involve an analysis of what interests are to be protected, whose interests are to be protected, against what are they to be protected, who is to be liable for damage, and when is he to be liable. As illustrative of some of the issues which would require resolution in an international agreement, let me briefly pose what occur to me initially as some alternatives on each of these phases of the general problem of principles of liability.

1. What interests are to be protected?

Property?
Personal injury?
Death?

2. Whose interests are to be protected?

Injured nationals of the State where the source of the damage is located?
Nationals of any State damaged by any source?

3. Against what are these interests to be protected?

Research reactors?
Power reactors?
All types of reactors?
Fuel element fabrication or reprocessing installations?
Any operation involving radioactive substances?
Is the agreement to cover any damage from atomic energy installations?
Or should its coverage be limited to damages resulting from nuclear risks such as those arising out of the radioactive, toxic, explosive or other hazardous properties of source, fissionable, or radioactive materials?
Should the coverage of the convention be limited to certain effects such as contact with radiation, fire, or explosion?
Or should it extend to any damage from atomic energy operations including operations in the nature of a nuisance?

4. Who is to be liable for damage?

The installation operator?
Installation owner?
Persons supplying design or engineering services?
Suppliers of equipment or components?
Contractors?
Persons who provide construction and installation services?

5. When is liability to be imposed?

Absolute liability?
Rebuttal presumption of negligence?
Negligence?

6. What defenses are to be permitted?

Causation?
Contributory negligence?
Independent acts of third parties?
Force majeure?

There must be considered whether the cause of damage is to be related to the damage itself; and then whether causation is to be expressed in terms of foreseeability. To a certain extent, the resolution of the causation problem is dependent in part upon the standard of liability to be adopted. If a standard of absolute liability is to be adopted it would appear clear that the casual rules of negligence would not be appropriate. It should be noted that absolute liability is not the common law of strict liability of the *Rylands* v. *Fletcher* type. Common law strict liability has been limited by the rule that the damage must result by reason of the particular quality which makes the instrumentality dangerous. This limitation is analogous to the limitation on liability for negligence imposed by the doctrine of foreseeability. If contributory negligence is to be a defense, then it becomes necessary to determine whether it will be a complete defense or whether a partial recovery will be permitted on the basis of comparative negligence. If this matter is left to local law, there will be wide variations in result since the civil law on the one hand quite clearly recognizes the concept of comparative negligence, whereas the common law as applied in many States of the United States does not generally recognize comparative negligence.

If the principle of absolute liability is to be recognized, the purposes of such a convention would not be satisfied unless there was imposed a maximum liability for damage. It would not be appropriate for me to suggest at this time what that maximum limit should be. Among the factors which would have to be considered in arriving at such a limit would be the variations in capacity for harm of various types of reactors, the location of reactors, and the type of operations conducted at the reactor site. A sliding scale of liability ceilings might be established based possibly upon the neutron flux of reactors. Another possible approach may be to limit liability at the point where private insurance is no longer available.

Just as in the case of the hearings last year on the Anderson-Price bills, so in the case of an international convention, there may be those who wish to inject exceptions to the limitation on liability for certain types of conduct on the part of the defendant. If this is to be done, it is suggested that the exception be stated not in some general terms of willful negligence but that there be employed language of the type used in the Hague protocol to the Warsaw Convention for the Unification of Rules Relating to International Carriage by Air. In this protocol the types of cases giving rise to unlimited liability arise if it is proved that the damage resulted from an act or omission of the defendant done recklessly or with the intent to cause damage and with the knowledge that damage probably would result, with the proviso that, in the case of such act or omission of a servant or agent, it is also proved that he was acting within the scope of his employment. This language of the Hague protocol contrasts with the wording of the original Warsaw Convention in that the latter imposed unlimited liabality if the damage was caused by the defendant's willful misconduct or by such default on his part as, in accordance with the law of the court to which the case is submitted, is considered to be equivalent to willful misconduct.

But in addition to considering such matters as the amount and exceptions to the limitation, other important problems would confront the draftsmen of such a limitation. Unless the limitations are applicable both to third-party claims against the United States manufacturer and to claims founded in contract by the foreign customer against the United States manufacturer, the purposes of such a convention from the point of view of the domestic atomic industry would not be achieved. If an absolute liability approach is taken with respect to the operator of the installation, it might be possible to regularize his recourse claims against the manufacturer or others and deny third parties a cause of action against anyone other than the operator.

Also to be considered is whether the limitations are to be expressed in terms of a "per accident" limitation or whether there are to be limitations with respect to the amount that any one person can recover.

Thought should also be given to the distribution of the maximum recovery in the event that claims exceed the maximum. One possible approach might be to give preferential rights to personal injury and death claims. Some specified percentage, such as one-half of the maximum, might be applicable to that category of claims exclusively and then all claims, including property claims, might share pro rata in the remaining balance.

Once the principles of liability are determined, the next logical step would be a consideration of the procedures by which an injured party could invoke the convention. On this phase of the problem, the first question to be considered is whether the convention should establish a single forum. As I have indicated previously in these comments, the conflicts of laws problems arising in the atomic energy field are peculiarly complex. These complexities arise not only from the already complicated principles of conflicts of laws applicable in any tort or contract situation, but also from the peculiar qualities of atomic energy which could foreseeably cause damage across international frontiers as a result of a single incident . This would be particularly true in Europe where distances between countries are not great. Therefore, in order to avoid a multiplicity of jurisdictions which would lead to enormous practical difficulties in applying the limitation of liability where a great number of claimants might be involved and where the claimants might be located in different countries, the convention might require that actions be brought only before the courts of the contracting nation where the incident occurred, or, stated differently, where the source of the injury was located. Unless the single forum approach is taken, any limitation of liability imposed by the convention might be ineffective since no adequate means might exist for proper distribution of the amounts covered by the limitation.

The next set of issues involves the procedures to be adopted for enforcement of judgment, once obtained. There must be considered whether this enforcement is to be left to the existing procedures of the laws of the various nations or whether an attempt should be made in the convention itself, to provide for the enforceability of judgments. Here, serious conflicts might arise between countries following the civil law pattern and jurisdictions such as the United States. In the United States foreign judgments are ordinarily enforced only by a new proceeding in which the foreign judgment is put in evidence as the basis for the claim.

Since it is likely that certain defendants would not be subject to the jurisdiction of a particular nation where the incident might occur, the right of recovery would be effective only if the convention provided an effective system for the enforcement of judgments. This might be accomplished by providing in the convention that any judgment obtained pursuant to it would be enforceable in the courts of any contracting party where the judgment debtor has his residence or principal place of business, or, if the assets available in that place and in the place where the judgment was pronounced are insufficient to satisfy the judgment, in any other contracting State where the judgment debtor has assets. This result would not be dissimilar to the nonresident motorist statutes in force in many States of the United States. Thus, in the situation where a California motorist injures a New Jersey resident, the New Jersey State official is made an agent of the California motorist for the purpose of service of process and the New Jersey plaintiff can sue the California defendant in New Jersey. Then, as a result of the full faith and credit clause of the United States Constitution, the New Jersey plaintiff can enforce the New Jersey judgment in California. Possibly the convention could provide for an international full faith and credit clause.

It is in this area, possibly, that most serious problems are presented from the point of United States adherence to such a convention. Although treaty provisions have prevailed over State policy with respect to limitation of tort liability in cases arising under the Warsaw Convention, objection might be raised to any international arrangement which would deny to the State courts the right to determine whether the judgment of a foreign court meets the procedural tests normally required by that State. In general, the courts of the United States in enforcing a foreign judgment at least test the jurisdiction of the foreign court and issuance of execution is refused if the jurisdiction of the foreign court when tested by United States standards of procedure is found unacceptable.

This question in turn raises the problem of the "due process" clause of the United States Constitution. Can the United States by treaty subject United States property to seizure in the United States by execution based on a foreign judgment when, but for the treaty, the judgment would not have been enforceable as lacking due process? Another phase of the due process problem is presented by whether a treaty can require every United States exporter of atomic energy equipment to consent, in effect, to the jurisdiction of the foreign court. Here, the question may turn upon the adequacy of notice and the opportunity to be heard in the foreign court.

As a possible assistance on the constitutional point, there probably should be some exceptions to the absolute enforceability of a foreign judgment under the convention. Such exceptions might include situations where the judgment was given by default and without adequate notice to the defendant or where the defendant was not given a fair opportunity to defend his interests or where the judgment was obtained by fraud or where the right to enforce the judgment is not vested in the person to whom the application for enforcement is made.

If further study were to indicate that the treaty power was not sufficient to permit United States adherence to an international convention of such a comprehensive nature, and if the treaty approach were felt to be the most feasible avenue to a solution, there might be considered the possibility of State legislation. The several States might authorize the Federal Government to negotiate treaties on their behalf and the Federal Government might make a treaty for the benefit of those States which passed legislation of the type set forth in the treaty.

Somewhere between the multinational convention approach and unilateral United States action lies the possibility of bilateral treaties. Here, many of the problems are similar to those discussed with respect to the international convention. However, this alternative should not be overlooked if it affords a feasible route to even a temporary alleviation of the problem. It may be that bilateral treaties with several of the nations where atomic energy export activity could be expected to be centered, would be easier of accomplishment than the conclusion of a multinational convention.

Although in some of the bilateral agreements concluded by the United States Government pursuant to the Atomic Energy Act of 1954, some foreign governments undertake to hold harmless the United States Government from any liability arising under the bilateral agreement, no attempt has been made in these bilateral agreements to provide indemnity or other financial protection to anyone other than the United States Government. If the Congress passes indemnity legislation covering domestic atomic activities, it might not be unreasonable to propose that foreign governments extend to the United States nationals protection in their countries equivalent or similar to that protection afforded by the United States indemnity legislation.

The CHAIRMAN. I believe you spoke on this problem last year when you appeared before this committee. Have you read the statement by the Chairman of the Commission on March 25?

Mr. STEVENS. I have not, sir.

The CHAIRMAN. The reason I raise the question is that Mr. Strauss in his statement before the committee had some misgivings as to approaching this problem on the bilateral agreement basis. You seem to think that is the best approach to it at the present time.

Mr. STEVENS. It seems to me, Mr. Chairman, that we have got to get at this some way or another. While perhaps the ideal approach is the multinational treaty, we will all be a good deal older before that is negotiated and ratified.

We have a more expeditious method—perhaps not the ideal situation—that at least would permit American industry to get on with their business of promoting this atomic activity in friendly foreign countries. That is the bilateral treaty or agreement.

The CHAIRMAN. I will read you Chairman Strauss' statement:

The Commission also noted that another possible solution would be to raise indemnity under our bilateral agreements for cooperation. On the basis of our study thus far, the Commission has reservation regarding the desirability of

this approach. It would require a cooperating country, as a condition to receiving the benefits offered by our Atoms for Peace program, to undertake the indemnification of private American capital. Rather than encouraging the sale of American reactors abroad, such a procedure might have the reverse effect.

Then he goes on to say that "we are continuing to study this suggestion, however."

Do you feel that it would have that effect from your experience with the international law?

Mr. STEVENS. I think this, Mr. Chairman. The position of the Atomic Energy Commission and of United States nationals in this question of bilateral arrangements will be infinitely strengthened if the Anderson-Price legislation becomes law.

In other words, then the United States Government will have taken the lead in this indemnification field and indicated its willingness to indemnify its nationals over the amount of insurance.

It seems to me that you would then have a far better reason for asking the foreign nations, if they are to receive the benefits of our special nuclear material and know how, and so forth and so on, to make similar arrangements.

The CHAIRMAN. In other words, they should pay for it.

Mr. STEVENS. To put it another way, I do not think we should pay for it. In other words, I do not think our nationals or our Government should stand as indemnitors to foreign nationals. It seems to me the weight is going altogether too far on our people here. If we are to pass the Anderson-Price legislation and that becomes law, it is only reasonable to ask the foreign governments entering into these agreements for cooperation to do something similar.

The CHAIRMAN. Mr. Cole.

Representative COLE. Mr. Stevens, you have always been very helpful to the committee in its problems and I find that is true today as previously.

What do you consider to be the class of persons who are indemnified by the Anderson-Price bill? Is it the persons who are injured from an atomic incident, or is it the persons who might be liable for the injury?

Mr. STEVENS. I am not quite sure I get your question.

Let me say this, Mr. Cole, and if I am not responsive to your question, please correct me.

I am not entirely sure I would agree with the view that has been expressed that we are going to get into a doctrine of absolute liability. I think our courts may very well limit that to some questions of negligence or fault. You have two approaches to the legislation. One is the approach of protecting the person or indemnifying the person who is liable, or pro bono publico—indemnifying anyone in the world who is injured.

My conception, I think, of this present legislation is that it is intended to indemnify the operator or supplier or what you will, who is liable. To the extent that he is not protected by insurance, that is.

In other words, it is the normal business type of liability protection.

Of course, that might possibly leave some holes, such as the classic example of the airplane that runs into the reactor and where the airplane company is not insured. I take it that the committee is think-

ing of going further so that the protection of the indemnity legislation would be extended to that as well.

Does that answer your question?

Representative COLE. That is very helpful. I can see, as you have indicated, that if the objective of the bill is to indemnify all persons who might be injured then it removes from the courts or it imposes on the courts, rather, the philosophy of absolute liability.

I am not clear as to what your first suggested revision of the bill does do. Would you amplify that a bit? Where you insert the word "required" in section 170c.

Mr. STEVENS. That is on page 9, Mr. Cole.

Representative COLE. Yes. Where you insert the parenthetical expression.

Mr. STEVENS. The parenthetical expression at the top of page 10?

Representative COLE. Yes.

Mr. STEVENS. I see.

Representative COLE. What is the effect of that?

Mr. STEVENS. This is the thing we have just been discussing. This would cover the type of accident where the airplane runs into the reactor and the pilot and the airplane company—say it is a private plane—had no insurance. In other words, except in cases of persons indemnified who are not covered by financial protection.

Representative COLE. By inserting the parenthetical expression as you have suggested, would the result then be that a claimant who might not successfully establish liability on the part of the reactor operator could nevertheless reach the airplane owner?

Mr. STEVENS. Yes.

Representative COLE. The effect of what you have suggested in parentheses would result in a claimant being able to reach the airplane owner and the policy would cover the airplane owner, even though the reactor operator were not held liable by the court?

Mr. STEVENS. That is right. I am going to ask, if you don't mind, my associate, Mr. Kern, to comment on that, because he has been studying this provision very intensively.

Mr. KERN. Mr. Cole, as I see it, the Anderson-Price legislation does not in and of itself establish any substantive rules of liability. It will only come into play once liability is fixed by the application of State law. So that this bill in and of itself does not establish absolute liability. The bill only says in case there is liability this is what happens.

So the question as to whether the person injured will recover against the airplane company or the airplane manufacturer or whomever, would depend upon the application of State law. The indemnity which is suggested here would only come into play if the airplane manufacturer or operator were found liable in the suit by the injured party under applicable law.

Representative COLE. Then you concur with Mr. Stevens that the affect of this parenthetical expression is to make available to the airplane operator the indemnity which the policy affords to the reactor operator, even though the court may not find the reactor operator liable?

Mr. KERN. Yes. If the airplane operator is found liable under State law.

Representative COLE. Yes.

Mr. KERN. That is right.

Mr. KILDAY. Would the gentleman yield at that point?

Mr. COLE. Yes.

Representative KILDAY. Do you regard it as important who is the party defendant in one of these actions before the court?

Mr. KERN. I think that is important. I do not know exactly what you are driving at.

Representative KILDAY. The point I am getting at is are you going to have a lawsuit against the insurance company as such where the recovery might be almost automatic or perhaps the amount exorbitant? Would the suit be against the operator of the reactor rather than against the indemnitor?

Mr. KERN. In the normal situation the suit would be against the operator or the person who was claimed to be liable. The insurance company would not be in the picture, as such, as I understand it.

Representative KILDAY. Depending upon the language of any legislation which is passed. Would that not be true? That is, whether we were assuming a primary liability or whether we were agreeing to respond in the event that the party was held to be liable.

Mr. KERN. It may very well be as provided in the Anderson-Price legislation that there would be cooperation between the Commission and the private insurance companies in a situation where the indemnity of the Government might have application. I should think, though, that in the normal case the actual suit itself would in the first instance be against the reactor operator or the equipment supplier and would not be against the insurance company or the Government.

Representative KILDAY. That is exactly what I am getting at. I want to make sure that the legislation is not in such form that that would be the case, that you would not have the situation of a suit against the Government or an insurance operator because the amount of recovery might be enhanced thereby.

Just as in the case of automobile liability insurance, if the suit should be against the insurance company rather than the owner or operator of the car. This is in such shape that would be true?

Mr. KERN. I do not see that this bill would change the existing situation on that.

In other words, as I see it, the suit would not be against the insurance company or the Government in the first instance.

Representative COLE. Does the bill make the United States Government a necessary or a proper party defendant to any litigation?

Mr. KERN. No, I do not see that it does. The only way that the United States Government can get involved is in the event that liability is fixed. The only way you fix liability is by having the injured person sue somebody he claims caused the injury.

Representative COLE. That is the only way the reactor operator can become involved by establishing liability.

Is it your opinion, then, that the United States Government would not be a proper party defendant to any litigation arising out of a nuclear incident?

Mr. KERN. I think it would be a proper party in an action which would come in under subsection (e).

In other words, if the application were made to the court having jurisdiction in bankruptcy for an order under subsection (e), then I think the Government, through the Commission, would be probably not only a proper but a necessary party. I do not think in the situation of the suit for negligence or the suit for damages in the first instance that the United States Government would be a proper party.

Let us say that the claims would not exceed the aggregate amount of required financial protection. Suppose the suit was for $100,000, and that was all the claims there were. The Government indemnity would not come into play. In that situation I certainly do not see where the United States Government would be involved in the private litigation. I think it would be involved only if subsection (e) or (h) came into play.

Representative COLE. The liability of the Federal Government attaches, then, only when the financial coverage by the reactor operator, through either his own resources or insurance protection, have been exhausted, even though the reactor operator may still have assets remaining.

Mr. KERN. That is the way I read it—financial coverage meaning the financial protection required by subsections (a) and (b).

The CHAIRMAN. Mr. Price.

Representative PRICE. No questions.

The CHAIRMAN. Mr. Kilday.

Representative KILDAY. I have no questions.

The CHAIRMAN. Thank you very much, Mr. Stevens.

Representative COLE. May I ask Mr. Stevens to suggest to me language which he might include in the bill I have introduced to attempt to solve the American producer selling abroad through a bilateral agreement? You have suggested something along the line of the Anderson-Price bill might be included in that.

Mr. STEVENS. I think it might, Mr. Cole. I frankly have not had a great deal of time to study your bill very carefully, but if you would like I should like to submit a memorandum to you with some suggestions.

Representative COLE. I would appreciate it very much. I will not go into it now because it is not directly pertinent to this bill, but I do think it is a very important problem and some solution must be found.

The CHAIRMAN. Mr. Ramey would like to ask a question.

Mr. RAMEY. I have one question as to the right of the Government to intervene under subsection (h) where the indemnity amount is involved. The Government not only has an obligation to collaborate but it also has the right to take over the conduct of a case. That would be after the indemnity were assumed.

Mr. KERN. That is the point I was making, Mr. Ramey, before. In the event that it appeared that the Government indemnification were to come into play, then the Government would have definitely the rights set forth in subsections (e) and (h).

Representative KILDAY. I do not believe that is the question Mr. Ramey asked, is it? He was referring to the right of the Government to take over. I assume that is similar to the regular provision to go back again to the automobile liability in order to avoid, perhaps, collusion between the plaintiff and defendant with the Govern-

ment later having to respond. The Government would have the right to come in and adequately defend the case.

Mr. KERN. There is no question that between subsection (e) and subsection (h) if it appears that the United States would have to respond under its indemnity agreement, it very definitely comes in and takes over the suit if it so desires. There is no question about that.

Representative KILDAY. They can take over the defense without becoming a party to the suit.

Mr. KERN. That is right.

Representative KILDAY. I understood that to be Mr. Ramey's question.

Mr. KERN. They would be an intervenor in that situation.

Representative KILDAY. I do not mean intervenor. What I am attempting to avoid is keeping the Government from there, with the idea, what difference does it make how much judgment we give here, this defendant it not going to respond, the Government or the insurance company will respond. I take it is properly written to avoid that.

Mr. KERN. I do not see at all that the United States would be in a position of being a party defendant in the liability suit.

Let us say in the negligence action; I do not see that it would be a party to that action although it might have a right to take over the defense and handle the case and make settlements and do anything it would consider advisable.

Representative COLE. When would be the appropriate time for the Federal Government to express its interest in the litigation? Does it have to wait until the aggregation of all the adjudications approach the insurance coverage before the Federal Government can come in and share in the defense?

Mr. KERN. The bill more or less leaves it up to the discretion of the AEC.

Representative COLE. Then if that is so, it would be possible for the AEC, if that is the agency representing the Federal Government, to participate in the initial litigation in the first claim.

Mr. KERN. Not as a party. But they definitely could participate under subsection (h) at any time.

Representative KILDAY. For its own protection as a practical proposition it would have to defend all suits from the beginning, would it not?

Mr. STEVENS. Don't you think that will be pretty well defined? In the unlikely event that you have a nuclear incident of substantial magnitude, is it not going to be a sort of Texas City case? Isn't everybody going to know as we did in the Texas City situation that there is a great possibility of exceeding the insurance coverage?

Representative KILDAY. They just divide up what is available.

Mr. STEVENS. It will be such a case that the Government will probably want to step in.

Mr. RAMEY. Subsection (h) provides language saying:

Such indemnity agreement shall provide that when the Commission makes a determination that the United States will probably be required to make indemnity payments under this section, the Commission's * * *—

et cetera, shall collaborate and shall have the right to take over the case.

Mr. KERN. Yes.

Mr. STEVENS. In other words, it is put on the basis of the assessment of your contingent liability, really.

Representative COLE. That does not square with Mr. Kern's interpretation of the time that the Federal Government can participate in the defense. His interpretation, as previously indicated, was that the Atomic Energy Commission could move in at any time.

Mr. KERN. At any time that the Commission determines that the claims would probably exceed the financial protection. My statement might have been incomplete there and hence misleading. In the case of a small incident where it was clear that under no possible circumstance could liability exceed $100,000 in aggregate, then I do not see that the Government would come in under subsection (h). I might have been unclear in my former statement. I meant it could come in at any time it determined that it would probably have to indemnify.

The CHAIRMAN. Thank you very much, Mr. Stevens and Mr. Kern.

The next witness is Mr. Ambrose Kelly, General Counsel of Associated Factory Mutual Fire Insurance Companies.

STATEMENT OF AMBROSE KELLY, GENERAL COUNSEL, ASSOCIATED FACTORY MUTUAL FIRE INSURANCE COS.

Mr. KELLY. Mr. Chairman and members of the committee, I am Ambrose Kelly, general counsel of the Associated Factory Mutual Fire Insurance Cos. I had the pleasure of appearing before you last year when you had somewhat similar legislation up for consideration.

I have prepared a statement which I believe has been made available to you. In order to save time I will read from the statement and then be happy to answer any questions you may care to ask.

The CHAIRMAN. You may proceed.

Mr. KELLY. The Joint Committee has before it Senate bill 715 and House bill 1981. These are identical bills intended to make it possible for the Atomic Energy Commission to supplement private insurance on nuclear installations so that, in the unlikely event of catastrophic loss which exceeds the capacity of private insurance companies, members of the public who suffer loss will be indemnified. The program of indemnity contemplated by these bills will apply both to licensed activities and to contractors who may be doing work for the Commission. Such legislation is badly needed and its enactment is essential if civilian use of atomic energy in the United States is to keep pace with worldwide developments in this field.

The Factory Mutual Companies, whom I represent, are a group of mutual property insurance companies which is a major factor in the insurance of industrial property in the United States and Canada. Many of our policyholders are quite active in the atomic field. They include manufacturers of research and power reactors, operators of fuel element fabrication plants, isotope processors and manufacturers of all types of equipment needed for the atomic program. We insure several public utility plants, including some that have already

announced their intention of building and operating nuclear reactors.

I might say this week we bound $8 million worth of insurance on a research reactor which is already in course of construction.

Representative COLE. What reactor is it?

Mr. KELLY. This happened to be the General Electric reactor at Vallecitos, Calif.

Our companies are all members of the Mutual Atomic Energy Reinsurance Pool and we will participate fully in its activities. They are also members of the Nuclear Insurance Rating Bureau and will use its forms and rates in providing coverage for direct damage on atomic risks. Our interest in the subject is, therefore, much more than academic, since, even now, we are binding coverage on fuel-fabrication plants and other installations. We anticipate that our companies will play an active part in providing property insurance protection to American industry as it moves into the atomic age.

When I wrote this I had the original draft of Senate 715 and the proposed bills. The proposed bills are very similar to those which were under consideration by your committee last year at this time. Report No. 2298, which you transmitted to Congress on June 22, 1956, to accompany S. 4112, contains a careful statement of the basic problem and the purposes of this legislation. It was the committee's intention, set out on page 8 of the report, to provide protection for the operator of a reactor on other property which he might also own and which could be exposed to contamination as the result of a nuclear incident. The committee used the example of a small research reactor located on the campus of a university. Similar examples might be found in industry, where millions of dollars in industrial property could very well surround a research reactor located on the plant premises.

Although from the report it was obviously your intention to provide indemnity for damage to property of operators of nuclear facilities located at the site of and used in connection with the activity where the incident occurs, the proposed wording of the bill does not accomplish this end. It merely provides indemnity from public liability and it then excepts from public liability damage to such property.

The Atomic Energy Commission, in its study of Senate 715, apparently reached the same conclusion, since the proposed redraft of Senate 715 which they submitted attempts to clarify this point. The terms "indemnity" and "indemnification" are defined on page 2 of their bill to mean an obligation to pay—

> the persons indemnified for damage to any of their property other than that located at the site of and used in connection with the licensed activity where the nuclear incident occurs.

The definition of the term "public liability" in the original bill is amended by striking out the reference to claims for damage to property.

In order to make the intent of Congress crystal clear one small further amendment is required in section 170c. This should read as follows:

> c. The Commission shall, with respect to licenses for which it requires financial protection, indemnify and hold harmless the licensee and any owner, operator,

user, manufacturer, designer, or builder of any facility or any part thereof to which such license applies, and any supplier of equipment, material or services used by such licensed activity as their interest may appear from public liability *or property damage* arising from nuclear incidents which is in excess of the amount of financial protection required: *Provided*, That such indemnification shall apply to all claims which may be made for bodily injury or property damage which result from nuclear incidents occurring during the license period which are discovered and for which claims are filed subsequent to the period for which private insurance coverage is available; and shall also indemnify and hold harmless any other persons indemnified from all public liability arising from nuclear incidents: *Provided further*, That the aggregate indemnity for all persons indemnified in conection with each nuclear incident shall not exceed $500,000,000. The Commission shall enter into a contract of indemnification with each of the above described licensees for which indemnity is provided, which shall cover public liability *or property damage* arising out of or in connection with the licensed activity.

The purpose of the additional words "or property damage" added in two places in section 170c is to make it clear that property of the reactor owner or operator, damaged as the result of an incident at a licensed facility and for which he is not legally liable, can be included within the protection of the Federal indemnity program.

Let us illustrate: Assume that a research reactor is built by a large university on its campus. We have this actual case since we insure Massachusetts Institute of Technology which is currently building a research reactor. Surrounding it are buildings and contents with a value of $75 million owned by the university. The reactor is insured in the factory mutuals and reinsured in the mutual pool for $5 million. In the event of an incident, however, there may be heavy contamination to the other buildings on the campus. There cannot be a liability claim, since the damage is the property of the reactor operator. The capacity required for full protection is beyond that of private insurers. In this case the Federal indemnity program should provide protection and the redrafted bill will do so.

It has seemed to me that you have consistently felt in all of your statements on this problem that such protection should be furnished. The problem here is to make certain that the act is so drafted that it will carry out the intent.

The private property insurance companies have made available insurance capacity in amounts never before attained on any single risk anywhere in the world. However, it seems clear from the testimony of the experts that there is a possibility of catastrophic loss which would go beyond even such massive protection. We, therefore, feel that it is imperative, if our atomic energy program is to go forward, that this bill be enacted. We feel that the amendments which we have suggested will carry out the intent of the committee and provide essential protection for the public and those working in the atomic field.

Respectfully submitted, Associated Factory Mutual Fire Insurance Companies: Arkwright Mutual Fire Insurance Co., Boston; Blackstone Mutual Insurance Co., Providence; Boston Manufacturers Mutual Insurance Co., Waltham; Firemen's Mutual Insurance Co., Providence; Industrial Mutual Insurance Co., Boston; Manufacturers Mutual Fire Insurance Co., Providence; Philadelphia Manufacturers Mutual Insurance Co., Philadelphia; Protection Mutual Insurance Co., Chicago.

Thank you very much.

The CHAIRMAN. Thank you very much, Mr. Kelly.

Have you had the time to study the changes in the bill as suggested by the Atomic Energy Commission?

Mr. KELLY. I have had some time, Mr. Durham. I would say I have been over it 3 or 4 times. I have not had as much time as I would like because it reached me late Monday afternoon and I had unfortunately other things I had to be doing yesterday.

However, by and large Iwould say that we feel that the changes suggested by the Commission would not be objectionable from our standpoint and we feel that in some instances, at least, they have clarified the bill. There were some sections in the original draft which I found it somewhat hard to follow. I think as redrafted it is somewhat clearer than the original bill.

The CHAIRMAN. Mr. Cole.

Representative Cole. Assuming the adoption of the amendments you have suggested with respect to property damage suffered by a reactor owner but not related to the reactor operation, does it mean that the property owner, since he is barred as a claimant against the reactor owner——

Mr. KELLY. Barred against himself.

Representative COLE (continuing). Is available to reach the Federal liability?

Mr. KELLY. Yes. That was the whole purpose of our proposed amendment. That is, to make it possible for the reactor operator who has other surrounding property of very substantial value to execute an indemnity agreement with the Federal Government which will not only provide protection for him from third-party liability above the amount of the private liability insurance available, but will also make it possible for him to secure protection against damage to his own property other than the reactor installation or the nuclear installation, if it is other than a reactor. A critical assembly testing facility, for example.

Representative COLE. So the Federal indemnity liability would accrue even though the amount of insurance protection has not been exhausted.

Mr. KELLY. There would be no insurance protection on the particular property covered under the program against the hazard of radioactive contamination. This is something on which the property insurance business is not in complete agreement. But there is a substantial body of opinion in the industry, of which my companies are a part, which feels that it will be essential that we exclude from our normal coverage damage from radioactive contamination originating off the premises.

Let me put it this way, Mr. Cole. We insure hundreds of millions of dollars in property in the industrial district in Chicago. It is located not too far from the Dresden project. We have no qualms whatever about that. We know the people who are building it. We know every posible safeguard is being taken. But if there should be a fire at the reactor when completed, which resulted in an incident and a release of fission products, we might have, very, very substantial damage from radioactive contamination in the industrial district which stands in the path of the prevailing winds from the site of the Dresden project.

We would like to exclude from our normal fire and windstorm properties on that property damage from radioactive contamination with the thought that if such an incident occurred and they did suffer damage they would then bring their claim against the owner or operator of the reactor and he would secure recovery from his private liability insurance, plus the Federal indemnity program proposed in this legislation.

What we are concerned with here—and I think the whole purpose of your program—is the catastrophic loss. What we would think as normal loss, even a $5 million, $10 million, $50 million loss, the insurance business can handle within its present facilities. We have given many instances of that. We are not concerned with it. What bothers us is the catastrophic loss. We would like to see this program so set up that when the catastrophic loss occurs, if it ever does, and all of us hope it never will, that top layer of loss will not fall on the insurance companies because, frankly, our group of companies could not take it.

We try to check the risks we insure very carefully. We try to establish what we call the PML, the possible maximum loss. We count on the protection available, the separation between buildings, firewalls, all of the other factors that are involved in fire or explosion insurance. Those we understand and we can handle. We can say of a property that we have insured for $100 million that the possible maximum loss there is no more than $15 million. But when we come to radioactive contamination from an outside source, we feel that we are unable to determine the possible maximum liability and we feel that the only place adequate protection can be secured is under the Federal indemnity program.

The CHAIRMAN. I believe yesterday Mr. Haugh said that whatever accident happened to a reactor and radiation was released, that under the policy they were writing, the radiation damage from that accident, which might be in Maine while the reactor was in Wisconsin, would be covered.

Mr. KELLY. His policy will cover that.

The CHAIRMAN. Yours will not?

Mr. KELLY. We are insuring a specific plant itself. If we are insuring a reactor we and all other companies in this field expect to include damage from radioactive contamination. If we have a reactor here—let me use General Electric as an example because it is a concern for whom we carry some insurance—if we have a reactor that they own here, we are perfectly willing to insure that for radioactive contamination.

But a mile from it or 2 miles from it is the main Schenectady plant where we are carrying perhaps $500 million of insurance spread over a whole complex of buildings. If there is an incident at the reactor which does damage at the plant and this reactor is being operated by General Electric, it cannot get any protection under Mr. Haugh's policy because it cannot sue itself. It is the owner of the property which is damaged as well as the operator of the reactor. It has no liability to itself. It has no protection under its liability policy and no protection under the Federal indemnity program unless you take this additional step of covering property damage for property owned by the reactor operator even where there is no liability.

Representative COLE. So that the immediate source of recovery would be the Federal Government.

Mr. KELLY. That is correct, sir.

Representative COLE. Irrespective of the amount of claims which GE might have to pay under its normal coverage?

Mr. KELLY. That is right.

The CHAIRMAN. Will you submit a copy of your policy for the record?

Mr. KELLY. I do not know whether Mr. Berry and Mr. Black yesterday submitted a copy of the policy which has been drafted by the Nuclear Insurance Rating Bureau, but as members of that bureau we would use exactly the same policy as they would use.

Representative COLE. Wouldn't your policy be the same as Mr. Haugh's?

Mr. KELLY. No. His is a liability policy. We are insurers against direct damage. Our companies insure against fire, windstorm, explosion, and in the new form which is being drafted for nuclear installations we will cover it against any steam boiler explosion, explosion of the pressure equipment, or an incident which results in the release of radioactive products. For example, let us take the incident which was recently reported in Idaho where there was an accident at a reactor which substantially destroyed the reactor. There was, so far as I know, no outside damage to anyone else's property. If we had a private reactor under the same circumstances, our companies would pay all of the loss and Mr. Haugh's companies would pay none of it, because we would be insuring the reactor itself which would have been badly damaged, if not destroyed. There was in that case as I understand it no outside damage.

Representative COLE. You insure only the property of the reactor owner?

Mr. KELLY. That is right.

Representative COLE. Of an accident that might occur from within the reactor itself?

Mr. KELLY. That is correct. Or from the standard perils of fire, windstorm, and so forth, that we now cover.

Representative COLE. You have heard about the airplane example.

Mr. KELLY. Yes.

Representative COLE. Would your policy protect the reactor owner in that event?

Mr. KELLY. Yes. For the reactor itself. If the airplane crashed into the reactor and was responsible for release of fission products which substantially destroyed it, our policy would cover the damage to the reactor itself completely. It is an all-risk form. The major exclusions in the form are the war risk exclusion which, as you know, we include in practically all property damage policies, and the earthquake exclusion. There are a number of others, but those are the major exclusions.

Representative COLE. Lightning?

Mr. KELLY. No; lightning is included.

Representative COLE. A damage caused by a trespasser?

Mr. KELLY. I would say so; yes. We are writing an all-risk contract and there is no exclusion which would apply to even sabotage, which would be covered. We get to the distinction between sabotage

and an act of war. An act of sabotage in war we would probably exclude. But if you have what we would think of as malicious mischief in time of peace we would cover.

We have tried to give a broad blanket of protection, and this is true of all companies in the property insurance field, not just mine—I do not want to claim any undue credit here.

The CHAIRMAN. Senator Anderson.

Senator ANDERSON. If you are only covering the property, why can't you estimate your losses? Why do you have any doubt as to how large your loss might go?

Mr. KELLY. As far as the reactor itself is concerned, we have no doubt. We know. We can issue a policy for $30 million or $20 million. In the case I mentioned it was for $8 million. We know what our liability is. But when we have, in a surrounding area, other property which we insure. We do not insure it on the broad atomic policy at all. We insure it against our standard perils, fire, explosion, and windstorm. What bothers us, of course, is that if there should be a fire, Senator, which results in a runaway of the reactor and a release of fission products, we cover without any question the damage to the reactor. But now the man over here was has a standard fire policy claims under the proximate clause rule that the contamination to his property was the direct result of a fire. As you know, the fire does not have to be on your own premises for the loss to be covered. If you have your dwelling house insured, for example, your recover for damage caused by smoke from an adjoining house on fire which damages your property.

So in this case that we are talking about, this tremendous amount of surrounding property which might run over a couple of hundred square miles, might all be damaged by contamination, and an effort be made to claim for that damage under the proximate clause rule. I discussed this at some length before the American Bar Association a couple of years ago. I felt that under the rule of reasonable probability set out by Judge Cardozo in the Black Tom case, there was at least a question as to whether or not the insurance companies would have to pay. I want to assure you that it would probably have to be tested in the courts, depending on how close the reactor was and whether or not there was any other intervening cause. We are talking about hypothetical cases now. An actual case would have to be considered on its own merits.

Senator ANDERSON. Who is going to pay the loss in Chicago if anything happens to Dresden?

Mr. KELLY. If anything happens to Dresden and it causes damage to property outside of the reactor installation it will come in under your third party liability coverage, except if Commonwealth Edison has another powerplant which is located 10 miles away which suffers heavy damage, it cannot sue itself. It has no liability claim. That is the hole, as I see it, that you need to plug.

Senator ANDERSON. Can we start with the Dresden plant?

Mr. KELLY. Surely.

Senator ANDERSON. Say you have it covered for fire hazard and so forth under an all-risk policy.

Mr. KELLY. Yes.

Senator ANDERSON. Let us assume something that will not happen, namely, that the Dresden plant blows up.

Mr. KELLY. Yes.

Senator ANDERSON. You will assume the responsibility for restoring the $45 million investment they have in that?

Mr. KELLY. That is correct.

Senator ANDERSON. Twenty miles away Commonwealth Edison has another plant. It is damaged as a result of this.

Mr. KELLY. That is right.

Senator ANDERSON. It is also insured in your company.

Mr. KELLY. Yes, sir.

Senator ANDERSON. Or a group of your companies, whatever it may be.

Mr. KELLY. Yes, sir.

Senator ANDERSON. Would I understand that under the provisions that have been suggested by the Atomic Energy Commission that your company would have no liability in the second plant?

Mr. KELLY. We expect, Senator, to endorse all of our policies to deny liability. We have not done so yet, but there has been a great deal of discussion in the industry. We expect to endorse all of our polices covering ordinary property, including your house and your store and Commonwealth Edison's generating plant 20 miles away from Dresden, to exclude radioactive contamination.

Senator ANDERSON. To exclude it?

Mr. KELLY. Yes, sir.

Senator ANDERSON. That is what we are trying to get. If you excluded it, then, the second factory is not covered.

Mr. KELLY. That is correct.

Senator ANDERSON. Who pays the loss?

Mr. KELLY. That loss is paid by the private insurers of Dresden. That second factory, then, if it is not Commonwealth Edison, has a liability claim.

Senator ANDERSON. Can we just stick to what it was?

Mr. KELLY. Yes. If it is Commonwealth Edison the only place it could recover is under this proposed bill if the bill is so drafted that it covers that other property of the reactor operator.

Senator ANDERSON. Who pays the loss?

Mr. KELLY. The Federal Government.

Senator ANDERSON. The Federal Government, that is right. We have heard so much about private enterprise. You spoke of discussing something with the American Bar Association. You probably have seen the American Bar Association has come out vigorously in favor of private enterprise.

Mr. KELLY. We are all in favor of private enterprise, including you.

Senator ANDERSON. Was Mr. Cisler in favor of private enterprise? Did he make an agreement yesterday to take $9 million out of the Federal Treasury?

Mr. KELLY. Sure he is for private enterprise.

Senator ANDERSON. I judge if you want the Federal Government to take this loss that you are not too enthusiastic about the private enterprise paying it.

Mr. KELLY. We are not in this case too enthusiastic about private enterprise paying it because we feel that private enterprise might not be able to pay it.

Senator ANDERSON. You do not mind collecting the premium.

Mr. KELLY. We are not going to be collecting premiums for this loss. You see, sir, the policies which we now issue for fire and extended coverage are at premiums which over the last year have not been adequate to pay those losses.

Senator ANDERSON. You cannot blame that on the Atomic Energy Commission or the committee.

Mr. KELLY. We have no loading in our rate now for radioactive contamination. The hazard has never existed up until now for this possible damage from radioactive contamination. We are not going to increase our rates to cover that additional hazard. We would find it very difficult to estimate how much it should be. We want to continue to insure that risk. That is, this Commonwealth Edison generating plant against the hazards we insure against now at the rates we charge now, or such other rates as may be made necessary as our experience develops.

Senator ANDERSON. I am only trying to find out who is going to pay some of these losses. You say now that if Commonwealth Edison, if you have insured the Dresden plant and it blows up, that you will pay up to whatever you have covered there.

Mr. KELLY. We will pay for the value of the Dresden plant which they have insured with us and we got the premium.

Senator ANDERSON. We will say 10 miles away there is a Commonwealth Edison plant and you don't pay that. You have excluded that radiation damage from your policy?

Mr. KELLY. That is right. And we have collected no premium for it.

Senator ANDERSON. A company is carrying the liability on the Dresden plant which causes that damage over there; does it pay for it?

Mr. KELLY. No. Our common-law rules of legal liability say that a man cannot collect from himself.

Senator ANDERSON. The Commonwealth Edison faces a responsibility that all of its property in and around Chicago will not be fully insured unless the Federal Government takes it over.

Mr. KELLY. That is correct. Let me throw in one further qualification, Senator. You are correct in your statement.

Senator ANDERSON. That is what I want to get.

Mr. KELLY. We have discussed in our group and with some of the other private insurance companies this question of writing radioactive contamination coverage for Commonwealth Edison on this other generating plant. We would be perfectly willing to do so up to our combined capacity.

In other words, if we have this small case of a research reactor at MIT, which we are going to insure for $5 million, and they wanted to buy $40 million in radioactive contamination coverage on the other buildings of MIT, we could sell them that. We can find that much capacity in the private insurance business and as far as we can go we will. But if they should happen to need $100 million, we have to throw up our hands and say to them, you have now gone beyond the capacity of the private insurance companies. You have to turn to the Federal Government if there should be a disaster of this kind.

Senator ANDERSON. Let us go on a step from that. We find now that Commonwealth can recover for its plant. It would have some

difficulty on its plant 10 miles away. Forty miles away from that reactor is the loop in Chicago and the area that you have referred to. Radioactive contamination settles on all the walls and corners of the Merchandise Mart. Who pays that?

Mr. KELLY. That will come in under your third-party liability program.

Senator ANDERSON. I want to know who pays it?

Company X has this liability policy down at Dresden.

Mr. KELLY. Company X will pay until it is exhausted.

Senator ANDERSON. They have $60 million on it.

Mr. KELLY. That is right.

Senator ANDERSON. The damage to Chicago is going to run $200 million.

Mr. KELLY. Yes, sir.

Senator ANDERSON. Who pays to clean the walls, let the people move out of the Merchandise Mart until it is safe to move back in again, spend a year standing idle, with the rent continuing? I suppose use and occupancy claims would come in. Who pays that?

Mr. KELLY. If there were $200 million in damage and $60 million in private liability insurance, in both pools, 60/200 would be paid by the private insurance companies which collected the premium and the 140/200 would be paid under the bill you proposed.

Senator ANDERSON. By the person who did not collect the premium?

Mr. KELLY. By the person who did not collect a premium for it; that is right.

Senator ANDERSON. In addition to that there is a substantial loss of life.

Mr. KELLY. Yes.

Senator ANDERSON. And people have some suits over that.

Mr. KELLY. Yes. Let us say we assumed $100 million in personal injuries and death claims, you then have a total of $300 million in possible claims, of which one-fifth, $60 million, would be paid by the private insurance companies, and the remaining $240 million would be paid by the Federal Government under the bill which you have introduced.

Senator ANDERSON. If there should be this airplane that dropped out of the skies on this reactor, then your company would not be liable, would it, in the initial instance?

Mr. KELLY. Yes; for the damage to the reactor itself we would.

Senator ANDERSON. That you would be liable for still?

Mr. KELLY. Yes.

Senator ANDERSON. There is nothing in your policy that excludes these things dropping from the sky?

Mr. KELLY. No, sir. As a matter of fact we cover that in all of our standard contracts and we would cover it now.

Senator ANDERSON. But when it got to the Loop and the airplane dropped out of the sky, then the Government would take the whole $200 million of damage plus a hundred million of public liability.

Mr. KELLY. There is a very interesting question. If you had an atomic powered plane with a reactor in it which dropped out of the sky.

Senator ANDERSON. No. You will not have to worry about that for 10 years to come. Let us get over this decade first.

Mr. KELLY. If the airplane hits the reactor and you have fission products released which fall on the Loop, then the damage which occurred as a result of that incident would either be paid under the Federal indemnity program or if any negligence could be shown, against the reactor operator—if I were the attorney for one of the people who suffered the loss—I would sue both.

Senator ANDERSON. What is that?

Mr. KELLY. If I were the attorney for the claimant, I would bring suit against the owner of the plane, the pilot of the plane, the operator of the reactor, and anyone else that my investigation showed might be involved, letting the facts to be developed as the case went along.

Senator ANDERSON. That is just par for the course.

Mr. KELLY. That is par for the course.

Senator ANDERSON. We all do that in the insurance business.

Now, having done that, this is a private flier who has $5,000, which is not enough to spit in the dust about; he is the only guy that really is liable.

Mr. KELLY. Yes.

Senator ANDERSON. Because he cannot prove whether he was or was not liable.

Mr. KELLY. Let us make a strong case. He took off against instructions from the tower; he was drunk, and so on, and then he flew into the reactor.

Senator ANDERSON. That is right. You could not prove any liability on the part of the people who operate the reactor.

Mr. KELLY. That is right.

Senator ANDERSON. So the $50 million or $60 million that the stock company and the mutual company pools have raised together with Lloyd's reinsurance out of London is not liable at all and the Government is liable for that, plus the $100 million; is that right?

Mr. KELLY. I think that is correct, Senator. What would you prefer, that these hapless individuals who owned property there not be paid by anyone? In the Atomic age, should these people who just happened to be living there 20 miles from the reactor suffer the loss. If someone does not indemnify them the impact of this loss falls on them. Doesn't society as a whole in the last analysis have an obligation to protect them? By society we move ultimately up to the Federal Government, our highest form of political organization—either this loss falls on those individuals who just happened to be there or it is paid by the Federal Government.

Senator ANDERSON. Was the Government responsible for them locating that reactor at Dresden?

Mr. KELLY. No, sir.

Senator ANDERSON. Then why should the Government pay?

Mr. KELLY. Because there is no one else left.

Senator ANDERSON. That is the theory under which we do a great many things.

Mr. KELLY. Is that the answer?

Senator ANDERSON. No, I do not think it is.

Mr. KELLY. Who should pay, Senator?

Senator ANDERSON. I think you ought to be able to get some insurance on the fact that you have built this reactor there and you should not be able to deny liability when you cannot prove that it is the fault of the person who created the reactor.

Mr. KELLY. You are moving into the theory of absolute liability.

Senator ANDERSON. Exactly. We have done exactly that in Workmen's Compensation. If a man is working in the factory and himself sticks his hand into a machine, he still collects.

Mr. KELLY. There are some cases, I believe—I know you are an expert in the compensation field.

Senator ANDERSON. I have tried it in court and every other way.

Mr. KELLY. There are possible exceptions.

Senator ANDERSON. I noticed a television film the other night where a fellow's automobile was next to a trolley line and they said don't get out of it, jump clear of it, and so forth, and I told my wife, I knew all about that. We paid on that. We had a man on a grader who bumped into a power line. He should not have bumped into it. He shoved his shovel right into it. Of course, the thing was very active. A foreman came to him and said "jump clear, jump clear." He said, "I will get off as I want to. I am scared of this thing." The foreman said, "jump clear," but the man stepped his foot on the ground and was killed.

Do you suppose my insurance company avoided paying the full amount of the death penalty with all the children and all of the rest of it? We paid every dollar of it in full.

I hope somewhere in this program we don't get to the point where it is to the financial advantage of the insurance company every time to show that the operating company running the reactor was not at fault, that it was Uncle Sam's fault in every instance.

I have the letter here from the Commonwealth Co. saying—this is the letter sent to Mr. Durham and I am sure it is in the record—recommending that there be no change in the indemnity regulations, that the tentative premium rates quoted by the insurance to cover the third-party liability rates—

> are considerably higher than we anticipated in figuring our economics of the project.

They add:

> The initial premium would be $250,000 for $50 million of liability coverage. However, we plan to try to live with the rates that are quoted.

I commend Mr. Gale and his company for their decision to try to live with these rates as quoted. I am trying to find out what the insurance company is going to assume in the way of liability for the $250,000. If all it is going to do is to be able to set up an elaborate defense that shucks it off on the Federal Government every time, then the Federal Government might do better to write a complete Federal insurance policy in the beginning. Is that what you are trying to get us to do?

Mr. KELLY. I certainly am not, as I think you realize.

Senator ANDERSON. We are close to it.

Mr. KELLY. Senator, in discussing a problem of this kind it is easy to imagine these incidents like the plane operated by the private pilot who is drunk, and so on, who crashes into the reactor. But those of us who have been in the insurance business, and I include both of us, know that the ordinary claim is not one of these exceptional cases, in this field, and I commend to you—and I know you have undoubtedly already studied it—the exhaustive study made by Columbia University on financial protection.

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Senator ANDERSON. That is excellent.

Mr. KELLY. They point out that undoubtedly the courts, if they do not come to a rule of absolute liability, are at least going to throw all of the burden on the reactor operator and owner to prove that there was absolutely no negligence on his or their parts. I have a strong feeling that, if we stop worrying about some of the hypothetical cases and go ahead with the program, you are going to find that almost all of the claims are paid by private insurance; and I would think you might operate for 10 years after this bill is passed and never have a single dollar paid by the Federal Government.

Senator ANDERSON. Or by the private companies.

Mr. KELLY. In all of the studies that have been made, it is indicated that this possibility of a catastrophic loss, which is what we are worrying about and which is responsible for your bill, is extremely remote. We, for example, are in the property-insurance field. We are going to be insuring that reactor. The claims we are going to pay, I am convinced, are not going to be from runaway reactors and discharge of fission products. They are going to be from the careless handling of flammable liquids. They will be from faulty electrical equipment which results in a fire. They will be because somebody was careless with combustible material. They will be just the same claims that we would pay if we were insuring any other type of plant. I think you are going to set this program up—and I sincerely hope that it is enacted—so that we all try to see that all of these possibilities are safeguarded against. Then you are going to operate for years and the Federal Government is not going to pay anything—I hope.

Senator ANDERSON. I know Mr. Cole wanted to ask a question. I only want to say to you that as far as I am concerned I was hopeful that what we were doing was trying to set up a bill, an act of law which would make it possible for these companies to go ahead without taking too much of a risk. If what we are now trying to do is to make sure that it all falls on the Federal Government, then maybe we better take the pattern of the war-risk insurance and let the Government run the whole show.

Mr. KELLY. We are not. At least I am not, nor my companies. We anticipate, as I said, that we will pay all the claims in the property-damage field. In the liability field, the liability pools will pay them. All we are concerned with here is the one-in-a-million chance of the catastrophic loss. When that comes—we are trying to set up machinery for handling it.

But this bill, as I understand it, and I think as you understand it, is not intended to take the load off, the private insurance companies and put it on the Federal Government. It is to set up machinery for handling the one-in-a-million catastrophe if it does come and the routine insurance will be handled through the regular channels.

Senator ANDERSON. I want to yield to Mr. Cole if he desires.

I want to assure you that it was not my purpose to try to bring out something that was impossible. But if I find out that here is the Commonwealth Edison layout in Chicago, and their own Dresden plant damages another one of their plants and the Government has to pay for it—I begin to wonder how much enterprise there is and how little of it is private. That is the main difficulty with it.

Mr. KELLY. I am in no position to speak for Commonwealth Edison, Senator.

Senator ANDERSON. I am not trying to be critical of them. I want to say, as I said many times, that I think Commonwealth Edison has done a fine job in going ahead. I have been very delighted with Consolidated Edison and Commonwealth Edison. They seem to want to go ahead and spend their own money. I notice that when Mr. McCune was testifying yesterday with reference to the Commonwealth Edison, he discussed the needs for this insurance and said "At present I see no alternative but to recommend that work on the Dresden station be halted as soon as practicable after the end of this session of Congress in case appropriate legislation has not been passed at that time."

That. of course, is nothing different—I say this kindly because I am very fond of Mr. McCune—but a shotgun that we know is loaded, because we know that this program has been turning out very much more expensive than some of the companies have anticipated.

If now it becomes so expensive between insurance rates and costs that they cannot go ahead, it will be very convenient to say, if we don't pass a bill, "You see, the Congress did not pass a bill, so we had to fold up."

I call your attention to the fact that Consolidated Edison said, "Damn the torpedoes. I'm going straight ahead."

Is it not strange, that one company would say "We cannot move, we will have to shut down unless you pass that bill; and another company says "We will go ahead"?

Mr. KELLY. I am only a poor insurance man and I am in no position to comment, Senator.

Representative COLE. I only want to clarify what I understood this bill to do.

In discussion with Senator Anderson, going back to the airplane, where you say that the pilot was drunk and the courts determined that the pilot was the sole person responsible for this accident, then the Federal Government would have to pay the claims. That is not the fact at all.

Mr. KELLY. As I understood the amendments proposed by the AEC—and I may have misunderstood them—it was intended to make it possible in that case in which the incident was due to the act of a trespasser—and I remember that phrase from Mr. Price's statement—that the Federal Government in that case would pick up the liability which would otherwise fall on the trespasser.

Representative COLE. Under the amendments proposed by the Commission.

Mr. KELLY. Under the amendments proposed by the Commission. We may be discussing two different bills. I was taking that as the revised bill and my comments were with reference to those amendments, Mr. Cole.

Representative COLE. Going to the problem of indemnifying the owner of property adjacent to a reactor but not connected to it: While it is true that common law does bar a person from suing himself, the common law can and frequently has been modified by a statute. Why cannot the statute correct that situation so as to make it possible for an insured reactor operator to be indemnified for losses that he may suffer in his own properties remote from the reactor?

Mr. KELLY. It might be so handled, Mr. Cole. One difficulty you get into is that in any attempt to change the basic rules of legal liability

by statutory amendment you always have the question of why should we make an exception in this case for this group of people. You always find coattail riders who are anxious at the same time to amend the law so it will fit other situations in which they are interested. It was my feeling and the reason why we proposed it at this time, that in your original report to the Congress last year you had indicated an intention to take care of these people who had other property and who, therefore, because they could not sue themselves, would otherwise be left without protection.

My suggestions here were all intended to see that the bill as enacted was clear on that point. As proposed last year, I did not think it was clear. I thought the amendments suggested by the AEC in their proposed redraft clarified it to some extent in that change in the definition of indemnity and if a further change could be made in section 170c it would be clear as to what your intent was.

Representative COLE. Why is it not the simplest and fairest way to resolve these two problems by providing in the policy that the insured is indemnified for damage to property remote from the reactor?

Mr. KELLY. That is in the liability policy?

Representative COLE. The other problem is that the insured is also indemnified for damage caused by a trespasser when the reactor operator is not held jointly liable.

Mr. KELLY. That would accomplish Senator Anderson's point. That is something Mr. Haugh could comment on much more than I could.

Representative COLE. I am discussing this with you as an objective expert.

Mr. KELLY. Thank you, Mr. Cole. You are moving away from a liability policy.

Representative COLE. Is there any reason why those two situations could not be properly covered in the indemnity policy?

Mr. KELLY. You would have to write a different contract than the one that is now contemplated. I do not know any legal reason why you could not so write the contract. But whether it would be practical to do so I would have to defer to the liability companies.

Representative COLE. What would be the problems making it impractical?

Mr. KELLY. You are writing a combination, then, a contract which is a combination really of direct damage insurance and liability insurance. The rates that were quoted for the Dresden project, which Senator Anderson mentioned, were based on a straight liability contract. You might come to the point where the actuaries of the liability companies might feel that additional premium was needed.

In the type of situation that we are talking about at Dresden where the other plants are some distance away, I would not have the faintest idea whether you would need a rate modification. I can't help keep coming back to this, Mr. Cole. These things we are talking about here are awfully remote possibilities. I hate to see us get off on side issues when discussing a bill whose basic purposes are so important. I am responsible for introducing one of those.

Let me say, in all honesty, if there is a question in your mind of passing a bill without making any provision for the property of the reactor owner or not passing the bill, I think this bill is so important

that you should not let this other problem get in its way. But if you are going to pass the bill and you feel that situation needs attention—and as I understood your original report and as I feel it should be written—it could be taken care of. I can see no reason why it should not be covered.

If you let this problem of the private plane operator who might drive his plane into a reactor divert you from your basic bill, it seems to me you are losing perspective. That is the 1 in 10 million chance. In most reactors a man could fly planes into it for a week at a time and never cause a runaway reaction.

Representative COLE. It is because these two situations are so very very unlikely and so very very remote that I would hope that it might be resolved in some fashion through the adjustment of the policy and thereby remove these two arguments which can be magnified and built up into a great story and result in not passing the bill.

Mr. KELLY. I think if you get off on those two points, in all honesty I would defer to Mr. Haugh and his associates who are much more familiar with that than I am.

Senator ANDERSON. You certainly would concede that you have given us another 2 or 3 months work by these new proposals.

Mr. KELLY. I do not think so.

Senator ANDERSON. I have to go back and study the whole question of war damage insurance and how it is handled, because if the Government is going to be the insurer it has to brush up on the business.

Mr. KELLY. If I felt anything I have said today involving this problem—this problem which will not come up more than 30 times in the whole United States, of the property owned by the reactor operator other than the reactor itself—it is a flea speck on the whole overall problem. I brought it to your attention because it was in your original report. I thought you had a definite intention to take care of it.

I was trying to be of some assistance to you in the drafting of language which would clearly take care of it or clearly throw it out. Let us not have a situation—and frankly that is the situation I was in after reading last year's bill—of not knowing whether you did or did not. For heaven's sake, let's not go to saying we have to restudy this for 3 months.

Senator ANDERSON. I would not say you were not in the situation of not knowing whether you did or not. We were all improvising a little bit. We were all playing a little by ear.

Mr. KELLY. That is right.

Senator ANDERSON. There has not been too much experience in writing policies on nuclear reactors. The committee might be excused a little if we didn't contemplate all these things.

This is the situation that bothers me at least. If there is a damage, a bad fire, let us say, in Chicago, and it causes a tremendous amount of smoke and it is near the Merchandise Mart—I use that only because I used to be in an office right across the street from it and looked at it day by day—if it damages that enormous building and spreads smoke through it, the people who are carrying the fire insurance contract on the Merchandise Mart will probably arrange to have it repaired. Then they may go back to the person who had the fire with the smoke damage claim and take subrogation against him and recover.

But the owner does not have to stand around for the rest of his natural life trying to find out whether the smoke that drifted into his place was caused by somebody who was solvent or not.

Mr. KELLY. That is correct.

Senator ANDERSON. In this particular case, however, we get to where that is not true. You are going to exclude from your policies radioactive damage and all the other companies are going to exclude radioactive damage and fallout from their policies.

Mr. KELLY. They may.

Senator ANDERSON. And then when the Merchandise Mart is loaded down with radioactive fallout, they are going to have to close down—somebody estimated a minimum of 18 months—while the building is cleaned up and gets rid of its contamination. That is a substantial loss in itself.

When it is all through and the cleaning work has been done and all the rest has been done, they won't know then to whom they should turn, because if the operator of the nuclear plant at Dresden could claim that a pigeon had flown in and got wedged in between some wires, it was not the fault of theirs and they did nothing wrong—it was this pigeon—I do not believe we want to wait there forever to try to find out whether the pigeon is liable and can make a financial contribution. Somebody is going to have to take care of the Merchandise Mart.

Mr. KELLY. The Merchandise Mart will probably take care of doing its decontamination job itself. Whether it is a pigeon or whether it is clearly the fault of the reactor operator you would have the same situation. You would have the same situation if you had an incident at an AEC plant today.

Senator ANDERSON. You would have no subrogation.

Mr. KELLY. In this I can speak only for my own group and not for the whole property insurance industry. We do not feel that we can pick up all of those claims for contamination over the whole area of the fallout, pay them and then attempt to recover on subrogation, because we are frankly afraid that we do not have enough dollars to do it. We have $300 million. That is all.

In the Chicago area we insure close to a billion dollars in property spread all over the place.

Senator ANDERSON. I do not recall now but it seems to me we have had situations like that where it was impossible to just pick up all the claims at once and they had to go around and find out what others were going to do. The Texas City disaster had to wait a long time and Congress finally took some part in it.

Mr. KELLY. Of the Texas disaster, I can speak with some feeling, we paid a million dollars in claims. We were participants in the subrogation suit which was brought in which an effort was made to collect from the Federal Government on the grounds of its negligence. That case went to the Supreme Court and was turned down. It was in litigation for 5 or 6 years. No recovery was secured by us on our subrogation claims. That was all right. We were dealing with a million dollars in loss. We didn't get any money back.

Senator ANDERSON. No money that Congress paid out?

Mr. KELLY. Not a bit. The bill that was passed by Congress was carefully amended so that there would be no recoveries made by the

insurance companies who were bringing claims for subrogation. That was a million dollars, Senator, and it is all right.

We collected a premium for fire insurance. We had a fire insurance loss. We have no complaint. If it were $200 million and it was not the result of a fire in our premises but it was the result of a fire in an AEC installation at Paducah, which caused an incident, we just can't do it. It would be alleged that we should pay this loss because it is under the proximate clause rule—the first cause of the damage was fire, and we are supposed to pay out $200 million in loss spread over most of Kentucky where we have some very large risks. It is impossible for us to finance any such subrogation claims.

Senator ANDERSON. I do not want to pursue this further. There was some testimony the other day about the situation when we are making reactors for export abroad. Is there some feeling that we ought to do something about the business abroad and that the United States Treasury should be responsible also?

Mr. KELLY. There again I have to admit a complete ignorance of it because our companies operate only in the United States. I have no familiarity with the problems you are going to have on liability abroad.

Senator ANDERSON. No. This is a reactor that was going to be ordered from Westinghouse, GE, or B&W for sale to the Government of Siam. It had to be tested in this country before it is delivered. Because there would be no way to take care of that, the Government of the United States was going to have to assume the responsibility for the testing of that reactor. I say there is going to be a growing sympathy for trying to get the Government in this insurance business.

Mr. KELLY. I do not want the Government in the insurance business.

Senator ANDERSON. Nor do I.

Mr. KELLY. I want to make that as clear as I possibly can.

The CHAIRMAN. Mr. Price.

Representative PRICE. I have no questions.

Representative COLE. I have no further questions.

The CHAIRMAN. Thank you very much.

Mr. Freer is the next witness.

Representative COLE. Before Mr. Freer starts, in view of the hour, late yesterday afternoon is the first chance I had to see the proposed policy by Mr. Haugh's group in which a number of exceptions are included. I would like to ask Mr. Haugh to submit a memorandum for the record at a later time, if you please, outlining the reasons for making the exceptions in the policy which you have.

Mr. HAUGH. The reasons for the exclusions in the policy?

Representative COLE. Yes.

Mr. HAUGH. I would be very happy to do that. That is to be submitted as a part of the record of this committee?

Representative COLE. Yes.

Mr. HAUGH. I will be glad to do so.

The CHAIRMAN. Without objection it will be placed in the record.

(The information referred to follows:)

APRIL 8, 1957.

EXCLUSIONS INCORPORATED IN NUCLEAR ENERGY LIABILITY INSURANCE POLICY

As requested by Representative Cole in the course of the hearing on March 27, I am setting forth below a brief nontechnical explanation of the exclusions incorporated in the nuclear energy liability policy, copy of which has been put into the record of this hearing.

An exclusion in an insurance policy serves one and sometimes two of the following purposes:

1. Exclusion of a hazard commonly covered by another kind of insurance.
2. Exclusion of a hazard not common to all risks in the class for which the policy is to be written.
3. Exclusion of a hazard which the insurer or the insured does not wish covered by the particular policy.

The exclusions in the nuclear energy liability policy form should be read with these purposes in mind.

EXCLUSION (A)

This exclusion, I believe, is self-explanatory. It merely excludes obligations under loss of the type referred to therein. Employers very generally either purchase workmen's compensation insurance or qualify as self-insurers for such coverage. A similar situation exists with respect to nonoccupational disability coverage in the few States which have so-called disability benefit laws. Similarly, there are definite statutes governing the provisions for meeting unemployment compensation benefits.

EXCLUSION (B)

This exclusion applies to the case of an employee who might be injured under circumstances which would enable him, if he so desired, to bring a claim against his employer under employer's liability in lieu of workmen's compensation. Coverage for this employer's liability is afforded under the standard workmen's compensation policy.

The situation with respect to the exclusions (a) and (b) has been recognized in all proposed indemnity legislation.

EXCLUSION (C)

The purpose of exclusion (c) is to make uniform the contractual liability coverage afforded each person who is an insured under the policy. The exclusion is not applicable to an agreement by a facility owner, the named insured, to hold harmless a contractor against loss by reason of claims against the contractor by employees of the facility owner or others caused by the contractor's negligence. That obligation assumed by the facility owner would be covered by the policy. However, if the facility owner agreed to pay any employee of the contractor $100 weekly if he suffered radiation injury while on the owner's premises, that obligation would not be covered by the policy because it was created by contract.

If any insured under a nuclear energy liability policy wishes coverage for a contractual obligation he has assumed and which is not covered by the policy, he can submit it to the underwriting pool which issued the policy and if, after analysis, the obligation assumed is insurable and is acceptable to the underwriters, the hazard will be rated and if the rate is acceptable to the insured, the coverage will be written.

EXCLUSION (D)

Exclusion (d) bars coverage for bodily injury or property damage due to the manufacturing, handling, distribution or use by the insured of any weapon or other instrument of war. From a study of the decided cases, as well as from reference to the dictionary and other authorities, it is clear that the word "weapon" and the word "instrument" include only the complete weapon or instrument, ready for use for offensive or defensive war. An atomic bomb, complete in every respect, is a weapon. Hence a nuclear energy liability policy issued to one who, with other nuclear operations, assembles and produces atomic bombs does not afford him coverage for nuclear incidents resulting from his bomb manufacturing operations. However, the nuclear material, which in the complete weapon renders it so destructive, is not a weapon when separate from the remainder of the bomb. Hence this exclusion is not applicable to the operator of a nuclear facility who produces material to be incorporated in an atomic

bomb produced by another. We understand that at present all atomic weapons are built by the Government.

EXCLUSION (E)

Exclusion (e), the war risk exclusion, is common today, in one form or another, to most insurance policies. Modern war, particularly war waged with nuclear weapons, will be so destructive that insurance companies cannot accept the risk of war losses. Indemnity for such losses, if it is to be provided at all, must be provided by the Government.

EXCLUSION (F)

Clauses (1), (2) and (3) of exclusion (f) bar coverage for damage to property which is or can be covered by physical damage insurance afforded by nuclear energy property insurance. It is suggested that contractors with and suppliers of a facility protect themselves against liability for damage to a facility caused by a nuclear incident occurring on that facility's premises by getting a hold harmless agreement from the facility owner or operator. In this connection it should be noted that the subrogation clause in the physical damage policy to be used by the physical damage insurers contains the following provision:

"* * * however, prior to a loss, the insured may waive in writing any or all right of recovery against any party for loss occurring to the property covered hereunder."

Clause (4) of exclusion (f) bars coverage for property damage to nuclear materials in the course of transportation. Coverage for this hazard is in the field of inland marine insurance.

EXCLUSION (G)

Consistent with proposed indemnity legislation, clause (1) limits the coverage afforded to nuclear incidents resulting from operations within the described territorial limits. Clauses 2–7 of exclusion (g) prevent duplication of coverage under two nuclear energy liability policies issued to two different facilities or under a nuclear energy liability policy and a general liability policy issued to one who is an insured under the nuclear energy liability policy. Exclusion (g) likewise bars coverage for a nuclear incident resulting from special nuclear or byproduct material which has been delivered to any premises of the United States or any agency thereof. In general, a nuclear energy liability policy issued to a facility is intended to afford coverage only for nuclear incidents occurring at the facility site as described in the policy declarations, or in the course of transportation of nuclear material from the facility, or to the facility from the United States Government. The policy also affords coverage for nuclear incidents resulting from the dispersion from a facility of fission products.

Clause (2) excludes coverage for a nuclear incident occurring at any production or utilization facility other than the facility described in the declarations of the policy. An operator who produces special nuclear material at a production facility and delivers that material to a utilization facility gets his products liability coverage, not under the policy issued to him, but under the policy issued to the utilization facility.

Clause (3) deals with the situation where an insured retains special nuclear or byproduct material produced by the facility and uses or stores the material for some purpose not connected with the facility and away from facility premises. The hazard resulting from his use of such materials away from facility premises may be insured either by specific nuclear energy liability insurance or general liability insurance dependent upon the nature of the material and the use to which it is to be put.

Clause (4) excludes coverage for nuclear incidents arising out of the use of used fuel elements sold or distributed to other than the facility or the United States Government. Coverage for this hazard is likewise excluded from standard general liability policies. The products liability hazard thus excluded may be expected to be covered by the nuclear energy liability insurance carried by the consignee or user of such fuel elements.

Clause (5) excludes coverage for nuclear incidents arising out of transportation or use, away from the insured facility, of radioactive isotopes for manufacturing, commercial, scientific or therapeutic purposes. The products liability hazard thus excluded may be covered by general liability insurance.

Clause (6) excludes coverage for nuclear incidents arising out of special nuclear or byproduct material sold or distributed by any insured under the

policy to the United States or any agency thereof. Clause (6) is not applicable to a nuclear incident occurring in the course of transportation of such material from the insured facility to the United States Government.

Clause (7) limits to one nuclear energy liability policy the coverage afforded for a nuclear incident occurring in the course of transportation of nuclear materials.

The CHAIRMAN. Mr. Freer, you may proceed.

STATEMENT OF GAIL L. FREER, PERSONNEL DIRECTOR, RURAL COOPERATIVE POWER ASSOCIATES, ELK RIVER, MINN.

Mr. FREER. Mr. Chairman and members of the committee, my name is Gail Freer. I am the personnel and insurance director of the Rural Cooperative Power Association at Elk River, Minn. I hold insurance licenses with the State of Minnesota for life, auto, and general casualty, which covers all of the liability problems of insurance.

I wish first to convey the sincere appreciation of the board of directors of Rural Cooperative Power Association for the committee's deep interest in our problems and for inviting us here to discuss them with you.

I should like to discuss two problems—that of third party liability and of physical damage, which we believe is a major stumbling block in the atomic energy program.

Our cooperative will soon be starting construction as soon as the Atomic Energy Commission approves our contracts, and we expect to have a 22-megawatt boiling water reactor in operation by January 1960. Our board of directors recognizes and wants you to know they appreciate the efforts being made by this committee and by the Congress to encourage and develop the atomic energy industry. They further feel that Senate bill 715, with a few minor additions, is a tremendous stride in the right direction, and, in our opinion, shows the authors of the bill to be very well informed about these matters and requirements.

Senator ANDERSON. What was that statement you made?

Mr. FREER. I want to discuss two problems that I think are very important, Senator. That is, the third party liability which is adequately taken care of in this bill, we think, but the physical damage is the one that we are really concerned about right now on our own properties.

Senator ANDERSON. I ask that question because when Chairman Strauss was testifying he said something about the fact that the lack of this insurance was a major obstacle—I better read his exact words—

That a poll indicated that lack of adequate protection against liability was a major obstacle to atomic energy development.

We had seen a consensus that showed that lack of financial incentive was a major obstacle. I do hope that you will indicate whether the lack of financial incentive is your major obstacle or the lack of insurance.

Some people said that Shippingport is going to have current available at 100 mills. That is a little more than the prevailing rate there. That is not much financial incentive.

Mr. FREER. I will go into that, Senator.

Senator ANDERSON. Thank you.

Mr. FREER. When I state a few minor additions might be necessary, I am referring to the fact that the bill adequately covers third-party liability, but does not make any allowances for the physical damage aspects of a nuclear incident to the operator.

I am attaching hereto copies of a proposed rate to Rural Cooperative Power Association and to others by the Nuclear Energy Liability Insurance Association, called NELIA, and the Nuclear Energy Property Insurance Association, called NEPIA, and ask that you seriously consider their rates in view of recent information we have received from Admiral Lewis L. Strauss, Chairman of the Atomic Energy Commission, on this subject.

I am quoting from the Chairman's testimony made March 25 on insurance problems wherein he states:

> Nuclear reactors have been operated since December 2, 1942, with a safety record far better than that of even the safest industry. More than 100 reactor years of regular operating experience have been accumulated, including experience with reactors of high power and large inventories of fission products, without a single personal injury and no significant deposition of radio-activity outside of the plant area. There have been a few accidents with experimental reactor installations as contrasted with the perfect record of safety of the regularly operating reactors. But even these accidents did not affect the public.
>
> This record which shows that safe operation can be achieved, is due to skillful design, careful construction, and competent operation.

In view of this past experience, we are completely unable to justify the insurance rates that have been proposed to us.

I was very happy to follow, Senator, Mr. Kelly. It seems to me, with all due respect to the mutual people, that they do not mind collecting the premium but they do not want to pay the freight. That is the way it looks to me.

Senator ANDERSON. I do not think he completely indicated that. I was trying to find out what they would pay, willingly.

Mr. FREER. First, we have been advised that in order to obtain insurance for our reactor, we must give the pool or the insurance company all of our insurance business on our present plant. This itself eliminates competition and restricts ourselves only to pool members for all coverage.

Senator ANDERSON. Is that so?

Mr. FREER. That is what we were told.

Senator ANDERSON. That might run into some awfully interesting activity.

Mr. FREER. There are 155 in the NEPIA pool and 40 in the Mutual pool. That leaves about 300 companies, if that was true, that would not be doing any business.

Representative COLE. You said you had been told that?

Mr. FREER. I say we were told that but I do not think it would hold true because we can go to our present insurers who are in the pool and get taken care of.

Senator ANDERSON. Mr. Haugh, is that a correct statement, that if you are going to bring the pool in, the person has to take all the rest of the insurance in the pool?

Mr. HAUGH. I want to clear that up, Senator. It has no relation whatsoever to it. This liability insurance pool, that is. It must come in through a member of the stock pool or through a member of the mutual pool. That particular coverage. Insofar as any other

coverage is concerned, most of it is individual companies. It has nothing to do with the syndicate. We would be happy to have it but we cannot demand it.

Representative COLE. Where would he get that idea?

Mr. FREER. We did not get the idea. They told us that.

Mr. HAUGH. What perhaps led to that erroneous conclusion—this is speculation on my part—the propery insurance policy which Mr. Kelly described this morning covers in that one contract, fire insurance, extended coverage, which normally are always combined, boiler and machinery which under normal conditions is a separate contract but because of the interrelation in this is going to be wrapped up in one policy, and possibly someone distorted that fact into saying you have to put all of it.

Am I not right in my statement, Mr. Kelly? Boiler and machinery is included with the fire?

Mr. KELLY. Yes. Our proposal is to give a single all-risk policy which will include fire, extended coverage, what is now boiler and pressure vessel and electrical machinery coverage, radioactive contamination and all other perils in one package.

Senator ANDERSON. What will be left?

Mr. KELLY. Automobile insurance.

Mr. HAUGH. Workmen's compensation would be left, general liability, automobile.

Senator ANDERSON. That has nothing to do with the factory.

Now a man can take fire insurance on his factory. When he gets through with this and tries to buy some liability, will he still be able to take fire insurance with his normal agent?

Mr. KELLY. On anything other than the reactor; yes. But on the reactor itself, or whatever risk falls within the nuclear pool, what we are running into is that there is such an overlap of hazard between fire and explosion and boiler, the only way we can do to do an adequate job and not have 2 or 3 companies arguing who should pay the loss is to write a single blanket of protection.

Senator ANDERSON. Does that include turbines?

Mr. KELLY. Yes.

Senator ANDERSON. It does apply to all property?

Mr. KELLY. At that particular location.

Senator ANDERSON. Then what the witness said is correct.

Mr. KELLY. If we are going to be asked to provide property insurance for that, the form which we have drafted—and here we were doing so on the basis of conferences with people in the industry who were telling us that they did not want separate contracts, they wanted a single contract covering all perils so that they would know they were covered. We seem to be in the interesting position now of being blamed for giving the owners and operators of these reactors what they told us they wanted.

Mr. FREER. Senator, they gave it to us all right but not the way we wanted it. The price is right. I can assure you of that. The price is very adequate.

Representative COLE. Would you rather be free to go and get fire insurance, property damage protection, wind and hail and lightning protection, in a different policy from a reactor damage policy?

Mr. FREER. Mr. Cole, when I finish the testimony here and sum up I would like to say what I would like to see in here and tell you what Mr. Kelly was asking for in Senate bill 715.

For an example of it, we have a quotation of 25 cents a hundred on property damage. We now pay 5 cents a hundred. It would cost us with the building of our reactor and building, $25,000 a year for property damage.

Representative COLE. You are paying 5 cents a hundred for what protection?

Mr. FREER. Property damage, sir; wind, tornado, and so on.

Representative COLE. Everything but reactor.

Mr. KELLY. Is that the steam boiler?

Mr. FREER. I am talking about fire. Won't we have to carry boiler and machinery insurance on our present properties, or will that go into the pool?

Mr. KELLY. This 25-cent rate quotation you have is not only for your present fire and extended coverage for which you are paying 5 cents, and in our developing of the rate it is brought in at 5 cents, but it also covers broader than you now have it, your steam boiler and electrical machinery coverage, for which you are now paying, I imagine 10 cents per hundred dollars. You have a different basis. Now you buy it on an object basis.

Mr. FREER. That is right.

Mr. KELLY. Here it will be loaded in the same rate. It will also cover the radioactive contamination hazard.

Mr. FREER. In that case I retract it is $25,000. It will probably be $40,000.

Mr. KELLY. Have you had a rate quotation?

Mr. FREER. Yes.

Mr. KELLY. How much was it for?

Mr. FREER. Twenty-five cents a hundred. I have it right here in the back. Would you like to see it? I also have some quotations from your pool on some of the others.

Mr. KELLY. This is a rate quotation from NEPIA. I, in all honesty, must defer. I have no contact with them. It says:

> A rate of 25 cents per $100 of value per year has been promulgated. This is in addition to the present fire, extended coverage, and boiler and machinery premiums—

which would apparently indicate that that 25 cents is——

Mr. FREER. It is for fire?

Mr. KELLY. No, it is in addition. It would make it a rate for radioactive contamination and the all risk coverage. It was my understanding that the Nuclear Insurance Rating Bureau which is going to make rates for this was not going to quote rates in this fashion at all. I do not know Mr. Harrison.

Senator ANDERSON. Did they?

Mr. KELLY. No. This is not a quotation from the Nuclear Insurance Rating Bureau or from either of the pools. It is a letter to the Rural Cooperative Power Association signed by John G. Harrison, and it says the bureau has promulgated rate indications. It does not indicate which bureau. It proceeds to give quotations for both property damage in NEPIA and third-party liability in NELIA.

Representative PRICE. Could you tell us who Mr. Harrison represents?

Mr. KELLY. I can't.

Representative PRICE. I believe he is with Travelers. He is connected with the Travelers Insurance Co.

Mr. RAMEY. Mr. Haugh ought to know.

Mr. HAUGH. Am I in this now?

Mr. KELLY. I withdraw in Mr. Haugh's favor.

Mr. HAUGH. This is your statement.

Mr. FREER. Yes.

Mr. HAUGH. I rather imagine——

Senator ANDERSON. Are you not with Travelers?

Mr. HAUGH. Certainly. Mr. Harrison is an agent.

Senator ANDERSON. Is he a representative of Travelers?

Mr. HAUGH. Among other companies; yes.

Senator ANDERSON. Is he authorized to quote for Travelers?

Mr. HAUGH. Yes. But not for property insurance. I do not know where he got the quote for property insurance, frankly. I know where he got the tentative quote on the liability part. The property insurance I do not know, Senator. May I say this: Mr. Freer mentioned, as I understand it, this interfered with his relations with his insurance representative, his agent or broker. As far as NELIA is concerned, we are not concerned. He is free as the wind to pick any insurance agent or broker he wants, representing anyone of the 135 companies in the NELIA pool. I think I am right in saying, although Mr. Yount is not here to confirm it, that as far as the Mutual Representative Pool is concerned, he is free to pick any representative of any one of their members companies to take care of the placing of his liability insurance in either one of those syndicates. You are not tied to any one representative at all.

Senator ANDERSON. This letter he has here is signed by John G. Harrison, vice president of Marsh & McLennan. As I remember, they are still a pretty well recognized outfit.

Mr. HAUGH. Yes.

Senator ANDERSON. You would not think they are passing around unauthorized quotations.

Mr. HAUGH. I would not expect that.

Senator ANDERSON. I wouldn't.

Mr. HAUGH. Nor would I. I have to confess I am not familiar with the source of the promulgation of the property insurance. I am sorry as Mr. Kelly is. I am sorry Mr. Black or Mr. Berry are not here to answer this.

Senator ANDERSON. You say this man is perfectly free to go to any one of the companies in the pool and take the insurance that he may want?

Mr. HAUGH. I am talking about the liability.

Senator ANDERSON. Are all the companies in America in these two pools?

Mr. HAUGH. Not every company in America; no, sir.

Senator ANDERSON. Therefore, if he is now buying boiler insurance from Hartford, and Hartford should not be in the pool, I assume it is in.

Mr. HAUGH. It is.

Senator ANDERSON. If it is not, he would have to cancel what he has with Hartford.

Mr. HAUGH. I want to straighten that out again.

Senator ANDERSON. This is a package deal, is it not?

Mr. HAUGH. No, sir. First let me talk to the liability end and let Mr. Kelly talk to the property. As far as liability insurance is concerned, the only liability insurance that we are undertaking to try to write in our pool is the liability for, let us call it, reactor incidents. He can place all the rest of his casualty insurance anywhere he wishes with any company, whether they are a member of that pool or not, and through any representative he sees fit to select. We do not tie any other kind of casualty insurance into the liability insurance to be afforded by the pool. There is absolutely no tie-in.

Senator ANDERSON. Let us say that this man has some fire insurance on his plant. It covers all the materials that is there now; the steam plant, turbines and so forth.

Mr. HAUGH. Yes.

Senator ANDERSON. He then adds a nuclear reactor to the outfit. Then because it is all there in one plant, will he not have to take all the fire insurance on all the rest of the plant?

Mr. HAUGH. I would like Mr. Kelly to answer that.

Mr. KELLY. What we have had in the actual cases, Senator, is that he builds next door to but still separate. You do not use the same turbines and generators and the fire boxes you used in your present steam plant for the new plant. On the new plant that he is going to build, which is going to consist of a nuclear reactor and turbines and generators that will enable you to convert that energy into electricity—it is all new—if he wants us to insure that in the pool, if he wants insurance against radioactive contamination coverage and all these other coverages, we say, we will give you a single policy that combines in one package the fire, the extended coverage, the steam boiler, the pressure vessels, the electrical equipment, and the radioactive contamination hazard, plus some additional hazards which you would never have under your other coverage because we are going to cover the failure of a fuel element tube inside the reactor.

Senator ANDERSON. Is the answer then that he will have to take the package?

Mr. KELLY. On the new installation we want to give him a single policy at a single rate covering everything. If he wants to buy fire, windstorm and explosion, and steam boiler separately, we say not in the pool.

Senator ANDERSON. That is right. And he cannot get insurance anywhere but in the pool.

Mr. KELLY. If he can find a company to write it——

Senator ANDERSON. What company can write $25 million or $50 million on a single risk?

Mr. KELLY. Senator, what we are trying to do, and we did not talk to this gentleman in advance of drafting our policy, from past experience where we have been insuring powerplants without any nuclear hazard, we have found many instances where there was a dispute between the boiler company and the fire company as to who was liable under a given set of circumstances.

Firebox explosions, for example, have come up that may be covered under either or both. We have had problems with electrical machinery where you have a fire in a motor.

Senator ANDERSON. You did not go back to the insured and say, look, we are going to revise this insurance business and no longer can you buy them separately. You have to buy them both in one package.

Mr. KELLY. As far as factory mutuals are concerned you cannot buy fire insurance at all. We have no rate.

Senator ANDERSON. The entire insurance industry is not run that way either.

Mr. KELLY. No.

Senator ANDERSON. I do not represent Hartford generally, but I can make use of Hartford steam boiler any time I want to and do.

Mr. KELLY. Surely. But the trend in the business, Senator, has been running very strongly, as you know, toward the so-called package policy.

Senator ANDERSON. Yes.

Mr. KELLY. The insurance business has been given some credit for a change for the fact that they now enable the dwelling house owner to buy a single package policy in one contract which covers him against hazards. The only thing that makes this complicated is the fact that here if he wants insurance in the property insurance pool he must buy the package.

Senator ANDERSON. What would you do in the case of Consolidated Edison which is building a new plant to generate now 275,000 kilowatts of which 150,000 is nuclear and 125,000 is going to be steam? It is all going to funnel into the same turbine.

Mr. KELLY. If it is all subject to radioactive contamination as I assume it will be, we would think it should all be written into the pool on a pool policy.

Senator ANDERSON. Does that not cover what the witness said?

Mr. KELLY. What I thought he said at the beginning was that we were also trying to say that we had to have all the other insurance on other property which he owned which we definitely will not permit at all.

Mr. FREER. I am talking.

You mentioned Hartford for example. We happen to be insured with Mutual Boiler. We have two, eleven five turbines and we are going to put a 22 next to it. They say you have Hartford over here and you have Mutual Boiler over here. It would be a lot better if you take this all in one coverage.

Mr. KELLY. You do not have to.

Mr. FREER. I know we do not have to. But that is what we were told.

Mr. KELLY. If I were your insurance adviser and I do not care which one you would switch it, I would say you would be better off with the same company.

Mr. FREER. We will be.

Mr. KELLY. Then we send an inspector there and he goes through once and we do not have to have two inspectors going a month apart going through the same premises.

Senator ANDERSON. Is Mutual Boiler in the pool?

Mr. KELLY. Mutual Boiler is in the Mutual pool and Hartford in the stock pool.

Senator ANDERSON. If a man bought a policy from the stock pool, Mutual might take a dim view.

Mr. KELLY. No.

Mr. HAUGH. There would be no difference there.

Senator ANDERSON. I think we have gone far enough on that point. The House members have had to go and I know I am due to vote on the tax bill.

Mr. FREER. Next, we are quoted for physical damage a rate of 25 cents per $100 of value per year. This would be an additional $25,000 per year to our present insurance costs.

We feel these costs are prohibitive because at the present time we are paying on this item at a rate of 5 cents per $100, which we would still continue to pay. The third party liability quotations, you will find, are terrific. Fifty million dollars worth of coverage would cost $77,430 per year. If we are required to buy $2 million of this coverage, it would cost our cooperative $14,000 for liability, $25,000 for property damage, for a total of nearly $40,000 per year.

The rate for liability of $30 per year per megawatt of thermal energy, as described in Senate bill 715, would be approximately $1,740, which, of course, would be in addition to the above $40,000 we have discussed. We feel that $40,000 insurance costs per year for a small utility such as ours and which does not include workmen's compensation costs, which may be increased, will be a severe bottleneck in expanding atomic power and especially to small operators.

What I am attempting to emphasize here and to present to the members of the committee is that while liability is taken care of adequately, it leaves a tremendous void in the other problems of property damage, as you can well see by our examples.

We are advised that, as we stated above, members of the pool require that the boiler and machinery coverage of our plant, which might be held with another company, not a member of the pool, would have to be transferred to the pool insurance company member. This, in our minds, sets up a monopolistic condition of obtaining this insurance. That is why many other companies who are not members of the pool would desire that the Government indemnify all nuclear incidents. They could then continue to write our policies at regular rates. In fact if the rates for Senate bill 715 were increased slightly and the coverage broadened to cover all nuclear incidents or radiation hazards to both property of the contractor or licensee as well as that of the third-party liability, then all companies could write coverage on atomic powerplants and, thus, adequate experience would be gained so that insurance companies could eventually take over the entire responsibility and ease the Government out of the problem in a manner that would not expose our insurance companies to unknown risks and losses.

We feel that 5 years' time should be adequate, including the Government's past experience in operating reactors for this indemnification privilege, to give our insurance companies enough data with which to write a fair and equitable rate.

We wish to extend our sincere appreciations for these privileges of talking to the committee and wish to congratulate them on the fine progress the committee and its staff is making in solving this problem.

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We sum this thing up by saying that we feel that the insurance is based so that the premiums of many pay the losses of a few. With very few reactor projects in operation it is necessary for insurance companies to charge rates far beyond what they normally would have to charge in order to build up a reserve. I have been told by a top actuary in one of the leading companies that if a radioactive contamination resulting from a nuclear incident was covered by the United States Government, their insurance company—and he could not speak for other companies, and this is a big company—could write the proper coverages at standard rates.

Senator ANDERSON. Say that again.

Mr. FREER. If radioactive contamination resulting from a nuclear incident was covered by the Government, all insurance companies could write the proper coverages at standard rates with no increase in price. He said his company would do it. I cannot speak for the other companies, but he feels it could be done.

I also have letters here that I have attached from three other insurance companies that feel that the costs are so high that it should be subsidized by the Government.

We certainly want to endorse Senate bill 715 if the physical damage coverage to the opertor's property was included. You mentioned, Senator, about $30 a thousand for a premium in your Senate bill.

Senator ANDERSON. Yes. There is objection to that, I find.

Mr. FREER. No, I should say not. If they included physical damage in this bill and increased that to even $50 or $60 a thousand we would certainly feel it was a very good bill.

Senator ANDERSON. I want to say, Mr. Freer, that I was not trying to put the Government in the insurance business.

Mr. FREER. No, we are not either.

Senator ANDERSON. On the other hand I can see if we let the Government assume a $500 million liability and did not make any effort to collect enough money for the Government's cost of inspection and things of that nature, a lot of people were going to ask why we were giving this subsidy to the generating companies. I do not say that it will build up any substantial pool. I do not have any hope of that. It was not done for that primary purpose. I find already there are exceptions to it which say there should be no charge of any kind in there for this.

Mr. FREER. If we only had 5 years' time, it would be adequate enough for the insurance companies to gain the needed experience to underwrite these claims and then let them take it over completely. I think it would give them enough time to come up with a rate that everybody could digest. Right now when you are talking about forty, fifty, or one hundred thousand dollars a year for rates for a small utility such as ours, the economical operation is out the window. We just cannot operate efficiently and economically on that kind of rate.

Senator ANDERSON. How much does your company, if you know, generate in current compared with the market of Commonwealth Edison?

Mr. FREER. Commonwealth, I think, is in here in this other quotation. Commonwealth gets 630 megawatts of heat and we will have

58. I enclosed also a copy of five reactors that have been bid on or received tentative premium quotation.

Senator ANDERSON. What does this insurance cost do to your calculation of mill rate? What I am trying to get at is this: I said a moment ago that the industry in their questionnaire indicated that the main thing that was holding back atomic power in this country is its economic value. It is just too expensive as they now see it. Whereas in England where they can see rates of 8 or 10 mills it looks very attractive and they are going ahead on a large scale. How does this insurance cost affect your calculations as to what your per mill cost will be?

Mr. FREER. You mean on our present generation?

Senator ANDERSON. Yes.

Mr. FREER. It raises it anywhere from 1 to 2 mills. I can't quote exactly on that, Senator, but I would say it would be in the excess of 1 mill, with the present cost.

Senator ANDERSON. Mr. Haugh estimated about six-tenths of a mill and the Marsh-McClennan letter indicated it was somewhere between a half mill to a mill and a half, plus or minus 50 percent. That is liability only.

Mr. FREER. They have to get into the physical damage end of it.

I want to say also that certain agents made the statement that we had to take insurance in the pool and leave out the others, that was not made by Mr. Harrison. I do not want him implicated in any way.

Senator ANDERSON. I am happy to have you say that because the Marsh-McLennan name is worth something and neither of us want to get it involved in this hearing improperly.

Does that complete your statement?

Mr. FREER. Yes. sir.

Senator ANDERSON. Thank you very much.

I think I am going to take advantage of the situation and put into the record at this point the Marsh & McLennan paper that was read before the National Industrial Conference Board at Philadelphia on March 14.

(The document referred to follows:)

INSURANCE AND THE ECONOMICS OF NUCLEAR REACTORS

By Edward I. Farley, vice president, and Alonzo C. Rand, atomic engineer, Marsh & McLennan, Inc., at the National Industrial Conference Board, 5th Annual Conference on Atomic Energy in Industry at Philadelphia, Pa., March 14, 1957

The economic burden of risk has been with man ever since he first ventured his capital resources for profit. As his wealth has increased down through the centuries, so has his need for financial protection against fortuitous loss. In fact, had he not devised means for managing risk, his progress would have been significantly impeded.

The dynamic industrial advances in the early part of our own 20th century were greatly facilitated by the existence of a strong and adaptable insurance industry. The early development and growth of the electric power, aviation, and chemical industries at times taxed the ability of the insurance industry to provide the limits and amount of insurance required; however, after relatively short periods of adjustment these requirements were successfully met.

The advent of the atomic age has brought a new challenge. Because a nuclear accident might cause incalculable injury to the public, the amount of financial protection needed, far exceeds anything previously required. Ways and means for meeting it have been explored during the past few years simultaneously with the development of plans by American industry to build and operate nuclear facilities. The availability of adequate financial protection at an economic cost is held to be essential to operation of these projects. This morning let us consider the extent to which such protection is available or planned, its cost aspects and the effect of these on the economics of the nuclear program.

The projects creating a special problem are those having a catastrophe potential. These include reactors, fuel fabrication, fuel reprocessing and waste disposal. The availability of adequate financial protection is not only important to each operation individually, but its aggregate cost will affect the economics of reactor operation. The insurance costs of fuel fabrication, fuel reprocessing, and waste disposal, for example, are an integral part of the kilowatt-hour cost of nuclear energy.

To provide a maximum amount of financial protection for the nuclear aspects of these operations, a large part of the American insurance industry has pooled its resources. Applications for third party liability insurance are now being accepted by the Nuclear Energy Liability Association (NELIA) and by the Mutual Atomic Energy Insurance Pool (MAEIP). Their combined capacity is approximately $60 million per installation. Five applications for insurance on reactors have recently been provisionally rated by a joint technical committee of these two groups. The standard public-liability exposures such as automobile insurance, comprehensive general liability, and workmen's compensation will be covered through normal insurance channels.

NEPIA and MAEIP will provide direct property-damage insurance in the combined amount of about $50 million per installation, subject to policy form and rates to be announced shortly. This amount is expected to be increased, through additional reinsurance. The policy will be an all-risk type and will include the standard coverage for fire and allied perils and for boiler and machinery perils.

For the present, business interruption risks will not be covered. Until this insurance is worked out by underwriters, the so-called business interruption and extra expense losses will be absorbed in general operating costs.

The $50 million per installation offered by the insurance industry to cover third party liability risks does not satisfy the amount of public liability protection desired by industry to meet possible damages and to justify risking stockholder assets in the nuclear field. Therefore, to encourage the development of the atomic energy industry and to provide additional protection for the public, Congress is expected to make available up to $500 million indemnity above a stipulated amount of this private insurance. When this Federal indemnity becomes available, the total amount of financial protection should then be adequate to remove concern.

At this point let us digress for a moment to see how underwriters will arrive at nuclear insurance rates; that is, how they will go about developing the premiums that will set insurance costs.

The third party liability insurance underwriters, NELIA and MAEIP, have endeavored to set rates that will be compensatory; that will build reserves exempt from normal tax processes and that will be economic. The rates will be a function of the amount of insurance; in other words, premium charges will be based on the amount of catastrophe protection. They will be graduated—so much for the first million with five steps up to the maximum available and they will vary with the estimated probability of loss and the amount of possible loss. This involves a classification system for nuclear reactors based on the best judgment of the variables inherent in each installation. The following factors will be taken into account with a system of rates for each:

Type of reactor
Use
Power level
Location
Containment

These factors are intended to recognize basic differences in design, in fact, that continuous operation is less hazardous than frequent startup and shutdown

and, the fact that wide flexibility is more hazardous than a more closely controlled operation. They are also intended to recognize that a large amount of fission products presents a greater hazard than a small amount although the ratio of hazard to power level is not an arithmetical one; that location in a highly urban locality exposes more people to loss than in a rural community and finally, that adequate containment is perhaps the most important factor of all. Even another factor may be added, when underwriters know how to evaluate it; namely, the human equation or the experience of the management and the operating personnel involved. Underwriters, however, believe it is too early to experiment in rate differences along this line. Finally, there will be a revolving rate adjustment based on the experience of nuclear energy policies. Provision will be made for allowing a return premium if it is justified by experience.

On direct property damage risks NEPIA and MAEIP are expected to come up with a rating system which will result in premiums that are adequate yet not excessive or discriminatory. The rating plan has been based upon the following principles established by NEPIA's advisory rating committee:

"* * * for all risks to be written by the pool, the full (manual) fire, extended coverage and vandalism rates will be the starting point. To these figures will be added standard charges for the conventional boiler and machinery exposures; then a rate charges for the nuclear perils, to be arrived at through use of a special schedule for the purpose; and finally an increment for the all-risk exposure not measured by any of the other rate charges. It is the rating plan for the nuclear exposures that now occupies the greater part of the committee's attention. The subject is a complex one as it is necessary to evaluate the hazards of the several types of reactors, kinds of fuel, various heat transfer mediums, control arrangements, containment, etc. The rate schedule will contain charges measuring all these factors."

Now let us assign some values to the costs that will be charged for private insurance and for Federal indemnity on nuclear power installations. The cost of Federal indemnity will not be a significant economic consideration. The indemnity bills now pending in Congress call for only nominal payments for maximum limits. The fees in the present bills are $30 or less per megawatt of thermal energy capacity; the annual charge for the reactors planned by the Consolidated Edison Co. and the Commonwealth Edison Co. would be about $15,000 each.

The provisional premiums indicated recently for third party liability insurance on five reactor projects do offer us some guideposts and these values we will come to shortly. The very few rate indications available for direct property damage insurance allow us, at the moment, only roughly to estimate a charge for this protection. Using the information available and our own judgment as necessary we have tried to anticipate the general effect of the cost of insurance on the economics of nuclear power.

Let us now compare the various cost factors for a modern coal-fired plant, a large nuclear plant of comparable generating capacity and a second nuclear plant of about one-tenth this capacity. We have arbitrarily chosen reactors of 400-megawatt and 40-megawatt thermal capacity. We do not specify a particular type of reactor but assume that it is of the thermal neutron variety and is similar to those now being planned for construction in the United States.

In economic studies of power production, the various factors of cost are usually expressed as a percentage of capital costs, of fixed annual charges or of the total cost of generating electricity. We will follow this approach but will use the thermal kilowatt instead of the electrical kilowatt for our basic comparisons. We do this because our insurance cost information is better interpreted on this basis and we avoid the need for assuming a load factor and a thermal efficiency.

We will use for the coal-fired plant a capital investment of $50 per thermal kilowatt which is a recognized average value. For the nuclear plants we will use values which we feel are a compromise between those for the first and second generation. For the larger plant we have chosen $70 per thermal kilowatt and for the smaller, $100 per thermal kilowatt.

For the coal-fired plant we use 0.2 percent of the capital investment as our value for the cost of all insurance and 12 percent for the rest of the fixed annual charges. Therefore, a little simple arithmetic indicates that the cost of insurance is responsible for 1.6 percent of the fixed annual charges. Now, let us see what the comparable figures are for the larger nuclear plant.

Three items make up the total cost of insurance protection in a nuclear plant. These are: third party liabiliay coverage on the nuclear hazards, direct property damage insurance and conventional insurance against nonculear perils. The cost of the latter should probably be some fraction of the cost we used above for the coal-fired plant; however, we will assume that the full 0.2 percent applies since the effect of any fractional adjustment would be insignificant in the final result.

Using recent, tentative premium indications as a base we estimate that the cost of nuclear third party liability insurance for the large reactor is 0.55 percent of capital investment and for direct property damage insurance, we will assume a cost of 0.4 percent of capital investment for all size reactors. Adding these three components the total insurance cost is 1.15 percent of the capital investment. This is 8.7 percent of the fixed annual charges or, about 5 times that for the coal-fired plant.

Let us see how our results will change if we allow a margin for error. Since we don't know at this time how close our estimates are, let's use ±50 percent. If the cost of nuclear insurance is 50 percent greater than we calculated above, the cost becomes 12 percent of the fixed annual charges as compared to 8.7 percent. If the cost of nuclear insurance is 50 percent less than above, it becomes 5.3 percent of the fixed annual charges.

For those of you who may be able to visualize this effect better in terms of mills per kilowatt-hour, let us convert the above results. We will assume that the thermal efficiency is 25 percent for the nuclear plant; the load factor is about 80 percent. We will further assume that the nuclear fuel cost is 6 mills per kilowatt-hour—this figure includes fuel element, fabrication, reprocessing, waste disposal, and operating and maintenance expenses. Using the first estimate, we obtain a total cost for insurance of 0.46 mills per kilowatt-hour. For the plus 50 percent case, the insurance cost is 0.65 mills per kilowatt-hour and for the minus 50 percent case, the insurance cost is 0.27 mills per kilowatt-hour. Thus, with the above assumptions, the error of ±50 percent in our estimate of of nuclear insurance costs amounts to a change of only about ±2 percent in the total cost of generating electricity of 11.3 mills per kilowatt-hour.

Insurance costs are a greater proportion of the total generating costs in the case of the 40-megawatt nuclear plant. The nuclear third-party liability insurance cost is about 1.6 percent of the capital investment per kilowatt. Repeating our calculations, we find that the insurance costs are 1.26 mills per kilowatt-hour and that an error of ±50 percent in our estimate corresponds to a change of roughly ±4 percent in the total cost of generating electricity of 14.1 mills per kilowatt-hour.

Although an error of 50 percent in our estimates might affect the total cost of generating electricity by roughly 4 percent, there are many other factors—fuel reprocessing, for example—where an error of only 10 percent might affect the total cost by 4 percent. We believe that the nuclear insurance costs for all the thermal neutron reactors announced to date will fall within our 50-percent margin.

In his booklet, Moving Ahead With the Atom, Dr. Paul F. Genachte, director of the Chase Manhattan Bank's atomic energy division, estimates a total cost for nuclear energy of 8 to 12 mills per kilowatt-hour. Our 11 to 14 mills per kilowatt-hour is comparable since the capital investments used by Dr. Genachte apply to the third and subsequent reactor generations, while ours are a compromise between the first and second generation.

Although some of our figures indicate that nuclear insurance costs are from 10 to 30 times those for a conventional plant, it must be acknowledged that the risks involved are about as similar as water damage and flood.

We do believe it is significant that the insurance costs of nuclear powerplants will be in the range of 0.5 to 1.2 mills per kilowatt-hour. Whether these costs are economic for all concerned—the power and the insurance industries—is a question that can hardly be answered categorically. We are, however, confident that present indications of insurance costs will be gradually reduced through greater knowledge of nuclear risks and through a good loss experience.

For some time to come nuclear insurance will certainly be an important factor in the cost of generating electric power. We are inclined to believe that it is not in itself likely to impede progress, nor determine whether reactors will produce power economically.

EXHIBIT

Insurance and the economics of nuclear reactors

	Coal-fired plant, 300,000 kilowatts (thermal)	Nuclear plants	
		400,000 kilowatts (thermal)	40,000 kilowatts (thermal)
Capital investment in dollars per thermal kilowatt of installed capacity	[1] $50	$70	$100
Fixed annual charges in (*a*) percent of capital investment and (*b*) dollars per thermal kilowatt—Insurance:			
Conventional [2]:			
(*a*) Percent	0.2	0.2	0.2
(*b*) Per kilowatt	$0.10	$0.14	$0.20
Nuclear 3d party liability:			
(*a*) Percent		0.55	1.6
(*b*) Per kilowatt		$0.38	$1.60
Nuclear direct-property damage:			
(*a*) Percent		0.4	0.4
(*b*) Per kilowatt		$0.28	$0.40
Other charges (including return on investment, depreciation, and taxes):			
(*a*) Percent	12.0	12.0	12.0
(*b*) Per kilowatt	$6.00	$8.40	$12.00
Total insurance and other charges:			
(*a*) Percent	12.2	13.15	14.2
(*b*) Per kilowatt	$6.10	$9.20	$14.20
Total insurance cost as a percentage of total fixed annual charges	1.6	8.7	15.5
Total cost of generating electricity in mills per kilowatt-hour [3]	[4] 6.5	11.3	14.1
Insurance cost in mills per kilowatt-hour	0.04	0.46	1.26
Insurance cost as a percentage of total cost of generating electricity	0.65	4.1	8.9

[1] See Economics of Nuclear Power, McGraw, Hill Book Co., 1957, vol. I, p. 175.
[2] Ibid., pp. 180 and 215.
[3] Assumptions:
(i)

	Thermal efficiency	Load factor
Coal-fired plant—percent	34	80
Nuclear plants—do	25	80

(ii) The nuclear fuel cost (fuel element fabrication, reprocessing and waste disposal) plus operating and maintenance expenses are assumed to be 6 mills per kilowatt-hour.
[4] Assumes conventional fuel cost of 40 cents per million B. t. u.

Source: Marsh & McLennan, Inc., by Edward I. Farley, Alonzo C. Rand, Mar. 11, 1957.

Senator ANDERSON. Mr. Slowter.

STATEMENT OF EDWARD E. SLOWTER, ON BEHALF OF BATTELLE MEMORIAL INSTITUTE, COLUMBUS, OHIO

Mr. SLOWTER. I am Edward Slowter; I am a chemical engineer from the Battelle Memorial Institute, and the business manager.

Senator ANDERSON. I want to say we have had the finest reports on Battelle that they are doing a fine job for the Commission. I think this might be a good place to say so once in a while.

Mr. SLOWTER. Thank you, sir.

To outline very briefly where we stand, I want to tell you what we are actually doing and where the insurance program as it now exists affects us.

As you know, Battelle is a research foundation conducting work for the Government and industry in the amount of about $24 million annually, of which about half is for the Government. In the past we

have had liability insurance coverage, general public liability, of a million dollars. Our operations are such that they are on a small scale and we have felt that our potential hazards were adequately covered by this amount of insurance.

Two years ago when the change in the law made it possible, we determined that we wanted to set up a reactor as a research tool. This has been done at a farm site about 15 miles west of Columbus. The insurance companies, through their local representatives, have worked with us in obtaining coverage for these operations. The reactor is now in operation. It is a swimming pool reactor of 1 megawatt of heat.

We also have a critical assembly laboratory adjacent to the reactor. We have other buildings at this site as well as our main plant back in Columbus. We are currently covered by our regular liability policy and are negotiating for a nuclear liability policy with NELIA.

We have encountered some of the problems that are being pointed up in this meeting such as definition of the terms that we are talking about, and the actual coverage as you go from the regular liability policy to the special policy and then to such coverage as might be afforded by the bill under consideration, Senate bill 715.

In the present policy that is expected to be used, we find problems such as these: there needs to be a definition of the facility so that we know, no matter where we are using special nuclear materials at our site, that we do have this coverage, because we may take the material from our reactor and move it to other areas. This is being worked out with our carrier at the present time.

We, like some of the others here, have been concerned about this wording for the property of others. Just one simple example will show the problem. Our reactor is on a large site and any visitors or employees may have their cars parked on this site, and they could be damaged by an incident.

We, of course, have the same problem that others have mentioned here of having other property on this site. It is a question of how to secure coverage of this. There is still another problem that relates to coverage outside of the United States. This comes about in the disposition of waste, which may be taken out to sea beyond the continental United States, and this is also being worked out with the carriers, but it is not yet clarified.

A further problem exists on the coverage of byproducts combined with special nuclear material. This is similar to, but not identical with, the isotopic materials that may be handled, and the wording of the present policy says that distribution of such materials is not covered. This is a question of definition, that is, what does "distribution" mean?

For example, we may prepare experimental samples for the research foundation at Ohio State which is adjacent to our laboratory and we take them over there. Is this distribution? This is one of the questions that has to be resolved before we will have adequate coverage.

These, I think, represent the kind of problems that are yet to be worked out. You have asked what is the cost of the insurance which has been quoted to us. Several of the other witnesses have already given our rates, I notice.

However, just to cover it, the first million of coverage is $6,250 per year; $5 million would be $15,250; $10 million would be $20,500; $50 million, $50,500.

Senator ANDERSON. Can you afford that?

Mr. SLOWTER. Senator, I wish I knew the answer to your question. This is the problem with which we are wrestling. This is what I wanted to sum up.

Here are our basic problems:

First, can we secure coverage that will not leave gaps between general liability, the special hazards policy, and the indemnification provided by this bill? This we think is most important. This has been brought out in the discussion here, to see that you do not have areas where, in excluding items from your general liability policy, they have not been picked up under the special policy.

Secondly, what can we afford, and what is the proper figure that we need to provide as coverage? We are not fully settled in our own minds as to what this should be. We are working on it, both with the carriers and in consultation with the Commission. I cannot answer your question definitely, sir.

Senator ANDERSON. My thought was simply this: Perhaps in the swimming-pool type of reactor that you have on your campus, $5 million would be lots of insurance, and if so, you would recognize that a rate that cost you 10 or 15 or 20 thousand dollars for it might not be too much of a strain on your budget. You do have a dangerous weapon.

Mr. SLOWTER. That is correct.

Senator ANDERSON. But it could be that $50,000 a year would be quite a strain on your budget. That is why I had believed that this law should say that the Atomic Energy Commission, depending on type, might reduce the required coverage and in trying to decide how much they should require you to pay, they might look at the cost of it. The Atomic Energy Commission the other day testified pretty vigorously that they should not be interested in the cost of it.

I cannot see why that is not an extremely important matter in this situation as far as we are concerned. If we require you to carry $50 million and the rate is such that that cost is a prohibitive cost, then we have closed down your reactor and your research work. You may struggle with it trying to find the money somewhere else, but you have closed down some of your programs if you do it.

Therefore, I had hoped that the Commission, being good sound people, would say that they do not think that this reactor needs as much insurance as the very large reactor that Yankee or Consolidated are building, and therefore we not only recognize that the rate should be lower, and is, and we are glad of it, but the needs are lower. We are going to try to help you in every way possible. That is the purpose of the language of the bill.

Mr. SLOWTER. I think this is an important purpose. We feel very strongly that we should not be compelled to take out the maximum coverage possible—$60 million—if this is not a really fair estimate of the maximum hazard that we may be generating, which I think is the same thing you have in mind.

Senator ANDERSON. What I have tried to say previously is that if the Government should pick up the extra liability above $60 million on

the plant of Consolidated Edison, it ought to start picking up the extra liability way down farther on your reactor, the swimming pool type, and they ought to start picking it up over $5 million. That is why the bill was drawn so you did not have to take the maximum in order for the Government indemnity to apply. I would just as soon pick it up above a couple of million dollars in the case of a smaller reactor run by a research institute.

I think what we need to protect are these rather larger reactors that have not been tested. If we can build a swimming pool reactor at Geneva and pack all the people in the country right around it and see it and sell it to the Swiss Government so it is going to operate right inside that community every day, I do not think it is quite as dangerous as what they are going to build at Dresden. At least that is the way I look at it.

You may proceed.

Mr. SLOWTER. I think this is reflected in our position that we want to have proper coverage but we do not want to be forced to have excessive coverage.

The other phase of the problem is that we want to make sure as the insurance agreements are written that we have not left out important coverages that are necessary for our protection and those of the general public.

Senator ANDERSON. You carry some protection now?

Mr. SLOWTER. Yes, sir.

Senator ANDERSON. What does that cost you compared to what this cost will be?

Mr. SLOWTER. At the present time the cost of the million-dollar coverage—this is general public liability—and $500,000 additional property damage in 1956 is $6,100. This is all nonnuclear liability at our whole site.

Senator ANDERSON. That would indicate that the first $1 million on this suggested rate is not out of line.

Mr. SLOWTER. If the risk associated with the atomic operations is equivalent of that of all else we do.

Senator ANDERSON. Nobody knows that.

Mr. SLOWTER. That is correct. I would point out that from the standpoint of the number of personnel involved and from the number of dollars invested that the atomic operations are a comparatively small part of what we are doing. That is, these particular facilities.

Senator ANDERSON. I did not ask my question properly. Do you have any special charge for the atomic operations that you now have?

Mr. SLOWTER. We are paying $500 a month, which is $6,000 a year, in this interim period until our coverage is actually provided.

Senator ANDERSON. Thank you.

Do you have any other observations?

Mr. SLOWTER. That is all, sir.

Senator ANDERSON. Thank you very much. I appreciate your being patient.

Mr. SLOWTER. Not at all, sir; thank you.

Senator ANDERSON. The committee is adjourned until 2 o'clock.

(Thereupon, at 12:40 p. m., the hearing was recessed, to reconvene at 2 p. m., the same day.)

AFTERNOON SESSION

The CHAIRMAN. The committee will come to order.

This afternoon we have as the first witness Dr. Lee L. Davenport, president, of the Sylvania-Corning Nuclear Corp.

Dr. Davenport, will you come around, please.

STATEMENTS OF DR. LEE L. DAVENPORT, PRESIDENT, SYLVANIA-CORNING NUCLEAR CORP., AND HOWARD COHEN, COUNSEL

Mr. DAVENPORT. On my left, by the way, is Mr. Howard Cohen, counsel for Sylvania-Corning Nuclear Corp.

The CHAIRMAN. All right, you may proceed.

Mr. DAVENPORT. My name is Lee L. Davenport. I am the president of Sylvania-Corning Nuclear Corp., and am appearing on its behalf.

On November 13, 1956, Sylvania Electric Products, Inc., and Corning Glass Works, announced their intentions of forming a jointly owned subsidiary to be called Sylvania-Corning Nuclear Corp., for the purpose of expanded research, development, and production activities in the nuclear field.

It was announced that the two parents would contribute to the new subsidiary their respective assets and experience in the nuclear field, thus making available to it Sylvania's extensive background in metallurgy and Corning's leadership in ceramics.

On March 7, of this year, Sylvania-Corning Nuclear Corp. was legally organized under the laws of Delaware and on April 1 it will become a fully operative company.

One of the first major problems with which Sylvania-Corning Nuclear Corp. will be faced will be the problem of its potential liability to third parties arising from its manufacture and supply of reactor fuel elements and components.

This problem may, in the not too distant future, be further complicated by our company's projected entry into the fuel reprocessing business.

That is, if our proposed suggestions to the Atomic Energy Commission are acceptable to it.

At the conclusion of my statement I will respectfully offer some suggestions as to the adequacy of the proposed indemnity legislation to meet this problem. However, for these suggestions to be meaningful, I feel that it is essential that the committee be acquainted with our experience under present Commission policy and the problems we anticipate under the proposed pool insurance policies.

In the case of strictly commercial enterprise pursuant to AEC licenses, as you know, section 53 (e) (8) of the Atomic Energy Act of 1954 requires that the holder of a special nuclear material license hold the United States and the commission harmless from any damages resulting from use or possession of special nuclear material by the licensee.

We believe that this, combined with the awareness of the part of the reactor builders and operators of their own potential liability problems, renders it virtually impossible for a supplier to obtain indemnification on any nongovernmental job.

Moreover, even if indemnity from the reactor builder or operator were available, liability from a maximum catastrophe might well exceed the assets of all parties concerned.

The situation in connection with Commission contracts under the 1954 act is somewhat different, but no less serious. It raises a question as to the wisdom under the proposed bills of differentiating between mandatory indemnification to certain licensees and discretionary indemnification to Government contractors under similar circumstances.

As an AEC prime or subcontractor we are faced initially with a dilemma. If the contract calls for use of special nuclear material, we may attempt to obtain this material under our license or directly under the contract.

In the first case we are again confronted with section 53 (e) (8) of the act.

In the second case we are confronted with serious accountability problems. In at least one instance in the past year these accountability procedures—which by the way are enforced by the Commission—required us to halt all other work at our facility until work was completed on the special nuclear material involved under the contract in question.

Let us assume, however, that the accountability problems can be resolved, or that a particular contract does not require the use of special nuclear material.

It is our understanding that the Atomic Energy Commission has pursued a policy of treating each case on its own individual merits insofar as indemnification is concerned.

Our experience indicates that, in so doing, the Commission may have applied certain principles. In discussing these principles and their practical results, I want to emphasize that I do not intend any criticism of the Commission. I am certain that the Commission has done everything that it feels it can do within its legislative authority, and we at Sylvania-Corning Nuclear Corp. are deeply appreciative of the efforts of the Commission in this respect.

I have outlined these problems merely to illustrate the inevitable results of what the Commission honestly believes to be their lack of authority under the present law to formulate a comprehensive indemnity policy.

Our understanding of the Commission's approach to indemnification on contract work is as follows:

By "approach," I mean whether to grant or not to grant indemnification and the extent of that coverage.

1. It will authorize but not direct the regional offices to grant indemnities to reactor operators, reactor builders, and assemblers and fuel element suppliers in the following situations:

A. To direct prime contractors either at the instance of the cognizant regional office or at the insistence of the contractor;

B. If insisted upon, to the subcontractors of cost reimbursement type prime contractors on the theory that the low bid of the subcontractor constitutes adequate legal consideration to the Government for granting the indemnity.

A subcontractor for the reactor or the fuel elements may also be able to obtain, in more or less limited form, indemnity which the prime

contractor has succeeded in obtaining from the Commission and which the prime contractor is authorized to pass on.

However, the Commission apparently will not grant anything more to any subcontractor of a fixed-price prime contractor. In justification of the policy, the Commission apparently reasons that the prime contractor is already obligated at the fixed price, and there is therefore no legal consideration for granting anything further to the subcontractor unless the prime contractor can demonstrate that it is otherwise impossible to get the job done.

The indemnities granted pursuant to these principles may be more or less complete. Frequently they will not cover liability which may arise from nonnuclear materials, such as moderators, supplied under the contract, although such nonnuclear materials may be used in a reactor and may, therefore, subject the supplier to full liability for any excursion.

The Commission apparently feels that, with limited exceptions, there is no authority to grant any substantive terms of conditions, including indemnities, which may require the expenditure of public funds, except where they are absolutely essential to get the work done.

The Commission has apparently determined administratively that for the present, essentiality has been demonstrated only in the prime and subcontract situations I outlined a few moments ago.

We can fully appreciate the problems with which the Commission has been faced and its reluctance to act in any area where its authority appears to it to be questionable.

However, this very question as to the Commission's authority bears directly on the proposed legislation before the committee, and I believe warrants close scrutiny of the problems it has given rise to.

1. Although indemnities in varying degrees of coverage may be obtained in individual situations under the Commission's present policy, there is no way of estimating in advance what may be obtainable in any given case. This approach may result in inadvertent discrimination among contractors.

2. Even in those cases where adequate indemnification is ultimately obtained by a subcontractor, the protracted negotiations that are often required to obtain it frequently may so antagonize the prime contractor as to jeopardize future business relations with that contractor. We have been confronted with precisely this situation in the past year.

3. The approach which the Commission apparently has taken further results in a line being drawn between the reactor operator, builder, and fuel element supplier on the one hand, and the supplier of other parts, such as moderators or control instruments, valves and nuts and bolts on the other hand, despite the fact that all may be subjected to equally serious potential liability should a reactor excursion be attributed to the components which they have supplied.

4. Finally, the Commission's discretionary policy on indemnification may result in inevitable emphasis, in awarding contracts, on whether or not indemnification is insisted upon rather than upon the price bid or the bidder's relative competency to perform the job.

Turning now from the problem as it has confronted us in the past year to the problem as we see it in the future, we have reviewed the third-party liability-insurance policy proposed by the recently formed insurance pool. We are deeply appreciative of the efforts made by the

insurance industry to help resolve this problem and are keenly aware of the problems with which they have been faced in attempting to do so.

However, while the premium rates which have been indicated may be entirely justified, we cannot ignore the fact that they will affect the cost of producing nuclear power.

We are concerned also with the areas which the proposed policies would leave uncovered.

Without going into great detail, I would like to point out 3 or 4 such areas which have given us the greatest concern, and which suggest the need for Government indemnity even beneath the dollar limit of financial protection provided for by the proposed bill. That is, to broaden the scope of the protection.

1. The policy is limited to claims which are actually made during the term of the policy and within 2 years thereafter. It affords no coverage for claims made subsequent to such 2-year period although the manifestations of injury may not appear until such later time and resulting claims may be well within the applicable statutes of limitation.

2. The policy covers only certain types of injury caused by source, special nuclear or byproduct materials. It leaves entirely open the question as to whether or not an accident, legally caused by some other material such as a moderator, but aggravated and arising further from the source, byproduct, or special nuclear materials used in conjunction with such moderator, would be covered by the policy. It is significant in this respect, that while the words "caused by" the specified material are used in the coverage section, the words "arising out of" are used in (g) (1) of the exclusion section.

3. The policy as presently drafted affords no protection to the supplier for damage to the nuclear facility of the ultimate user. Yet the value of such facility and, consequently, the potential liability for damages to it may far exceed the assets employed by the supplier in furnishing the product and, conceivably, the entire assets of many companies. While a contractor may be able to contract against such liability to the property of his direct customer there would not appear to be any practical way of contracting against liability to the facility owner or operator unless he happens to be the direct customer. We understand that the insurance companies are considering the possibility of waiving subrogation against suppliers on this type of liability. This would be extremely helpful in resolving this problem.

In this background, it is no wonder that the industry anxiously awaits the outcome of the presently proposed indemnity legislation. The bills introduced by Senator Anderson and Representative Price would undoubtedly go a long way toward resolving many of the more serious aspects of this liability problem.

The favorable things which might be said about these proposed bills would far outnumber the few additional comments we may have on them, and this committee and the staff merit the highest praise for the splendid job you have done in this respect.

However, you have requested our thoughts on any respects in which the bills might be improved. Therefore, I would like to point out a few of the more vital areas in which classification or modification would be helpful in view of our past experience and the proposed

pool insurance policies on which the bills' financial responsibility provisions are premised.

1. The proposed bills as they now stand would provide for Government indemnification in excess of the amount of financial protection required up to a maximum of $500 million.

In view of the exclusions set forth in the proposed nuclear policies, I feel that it would be advisable to modify the proposed bills to provide for protection not only in excess of the total dollar amount of financial protection required, but also in excess of the extent or scope—in qualitative coverage—of financial protection which may be commercially available. In other words, the bills should provide for the Government indemnity to completely cover any gaps in the private insurance available to fulfill the requirement of financial protection.

2. The proposed bills, like the proposed insurance policies, exclude any liability of a supplier or others for damage to the reactor site. In view of the large potential liability with which a supplier may be faced in this connection, as I have suggested a few moments ago, it is our urgent request that this exclusion be reconsidered.

We recognize that the primary criterion of any legislation of this sort must and should be the public interest; we also recognize that inclusion of reactor site liability under the coverage of the bills would not serve primarily to protect the general public against financial loss.

We submit, however, that development of economic nuclear power and, therefore, the removal of any serious and perhaps insurmountable obstacle to such development, is clearly in the public interest.

3. Section 170 (d) of the bills authorizes the Commission to grant indemnity to Government contractors for the construction or operation of production or utilization facilities or research and development plants. Even assuming that subcontractors of such prime contractors would be covered under the indemnities granted to their prime contractors, this wording raises serious question as to whether indemnity will be available to parties such as the fuel element or component manufacturer who supply the Government directly.

In this connection I would like to add that at Sylvania-Corning Nuclear Corp. we have a direct Commission fuel element contract with the Savannah River office of the Commission which is not covered at all by the present terms of these bills.

I would also like to add that a very quick and brief review which we have had the opportunity to make of Mr. Price's comments outlining the provisions of the suggestions suggested by the Commission on this point seem also to overlook the problem of the direct supplier to the Commission with respect to potential liability for radiation resulting from a chemical explosion or from failure of the supplier's products in the reactor. Product failure could render the supplier liable for all damages resulting from an excursion although the supplier himself did not construct the facility or use any special nuclear in performing the contract.

The Commission's recommendation would not cover the direct supplier of elements such as a control rod.

Section 170 (a) of the counterpart of these bills was modified last year to remedy this same problem with respect to licensed activities

and we urge that a similar revision now be made in section 170 (d).

4. Section 170 (d) of the proposed bills merely authorizes the Commission to enter into indemnity agreements in connection with Government contracts. To avoid any question as to the extent of the authority granted and any possibility of a continuation of the problems which have arisen under the present law, we strongly urge that the provisions applicable to Government contracts be made mandatory, at least with respect to those activities for which a requirement of financial protection and granting of indemnity would be mandatory if the activity were under a license.

As to those activities under license or contract on which indemnity is left to the discretion of the Commission, we feel that it is essential that it be made clear in the bills, or in the committee report, that exercise of such discretion need not be confined to situations where indemnity is essential to getting the job done.

5. Finally, with respect to the Government contract provisions, while section 170 (c) clearly makes the indemnity provisions applicable to existing licenses, there is no similar provision covering existing contracts.

6. It is questionable whether the proposed bills as they are presently worded provide any authority for indemnity coverage under contracts with the other Government departments or agencies, although they may involve substantially the same nuclear hazards as those with the Atomic Energy Commission. We understand that the Department of Defense is seeking appropriate legislation to this end. While I will not purport to raise the question of whether this problem falls within the province of this committee, I do wish to go on record as urging that the appropriate committee or committees give immediate attention to providing identical indemnity protection on all Government work.

While neither of the two bills presently under consideration have attempted or purported to meet the problem of liability in connection with export of production and utilization facilities or suppliers to the exporters, I feel certain that this committee is fully aware of the problems with which the industry is faced in this respect and intends to study this question further with a view to taking action on it at some future date.

In conclusion I want to take this opportunity to again thank all the members of this committee, and the staff, for the deep and sincere interest that all have taken in this, as well as the other problems with which our industry has been faced, and for the great strides that have been made to remove the roadblocks to development of a flourishing private atomic industry in this country.

It is our sincere hope that the foregoing comments will be of some help to this committee in arriving at a full understanding of one of the major problems with which the industry is still faced and consequently will aid the committee in coming to a determination on the final form of bill which will be recommended to resolve this problem.

The specific comments which I have made on the proposed bills have been made solely with this object in mind.

The anticipated liability problems of last year have become the dilemmas and roadblocks of today.

As indicated in last year's testimony, these roadblocks bid fair to bring the industry to a standstill. If the industry is to progress and

the public to have the protection that it deserves, there is an immediate and urgent need for adequate indemnity legislation.

The Anderson and Price bills with the modifications I have suggested would achieve this end without question.

However, I want to reemphasize that the proposed bills, as presently worded, represent a significant step toward resolution of the problem.

In view of this and the immediacy of the need for legislation, if the modifications I have suggested would unduly delay legislation, I think there is no question that the bill enacted as is today would be preferable to a more complete bill enacted 6 months from now.

We sincerely hope that in this case the needs for revision and immediate action are not mutually exclusive. We feel confident on the basis of this committee's past performance that our hope is not an idle one.

If any of us at Sylvania-Corning Nuclear Corp. can be of any help to this end, we trust that you will not hesitate to call upon us.

I would like to add that we can give certain specific contractual examples to reinforce this testimony if they would be of any help to this committee.

The CHAIRMAN. Mr. Davenport, that is an excellent statement. Certainly the committee is glad to have these suggestions. In the final writing of the measure we certainly will take them into consideration.

Mr. DAVENPORT. We will be very pleased to have you do so.

The CHAIRMAN. Are there any other questions?

Mr. RAMEY. You mentioned at one point that the proposed bills do not have any authority for other Government departments or agencies to enter into indemnity agreements.

There is language that would permit the Commission to indemnify other agencies and/or their contractors under joint projects, as I understand, in the atomic energy field. This was intended to cover such things as the ANP project in which the Air Force participates, the naval reactor projects where the Navy organizations participate to some extent under parallel contracts. But it does not cover the broad scope of all defense departments.

Mr. DAVENPORT. I see.

The CHAIRMAN. Your suggestion would be largely covered in the present bill that we have before us, if I get the point of all your recommendations.

Mr. DAVENPORT. Certainly one strong representation which we make is that the gaps in the proposed insurance coverage be filled by the proposed bills' coverage.

Mr. RAMEY. Some of the members have suggested that possibly those gaps might be filled by the insurance policy. It might be extended; since it already, by means of a third-party-beneficiary concept, covers other than the reactor operator, it might take care of that falling airplane and some of those other things.

Mr. DAVENPORT. From our point of view if the coverage is available at reasonable costs, we would be very pleased to see the insurance companies through their pool policies extend the coverage to degrees where it is not now extended.

The CHAIRMAN. Have you had time or have you gone over the cost of the policies? If so, give us you opinion as to what you think of the rates proposed by the insurance companies.

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Mr. DAVENPORT. I must say at this time that we have not had official notification of the rates proposed by the pool policies to permit us to study in the degree that it would be necessary to make a recommendation before this committee.

I can only say that the atomic industry is in a sense fighting an uphill battle, a competitive battle with other fuels for position in this country and anything which adds to the costs of doing business in the atomic field further places it down the ladder with respect to the problems of doing business in competition with other fuels.

The CHAIRMAN. It certainly places it in a competitive way in a less favorable position.

Mr. RAMEY. Are you presently covered third-party liabilitywise under your existing insurance in your present operations covering your nuclear energy work?

Mr. COHEN. We presently have $10 million of product liability coverage. However, it is our understanding that when the new pool policies become operative we will receive a rider to that policy that will exclude nuclear incidents from the coverage.

I might add that $10 million is, to the best of our knowledge, the most that is available today for such coverage.

Mr. RAMEY. Do you think that is adequate for your operations in your fuel fabrication business?

Mr. COHEN. We think it is all we can get. We think it is not adequate by any means to cover all possible product liability. It may be adequate conceivably to cover our present site liability.

But we feel that the potentialities of a reactor catastrophe as a result of which we may conceivably be held liable for all damages are such that this policy is not adequate in the absolute sense of the word.

The CHAIRMAN. Is it the purpose of your company and intent, of course, to get into the production of reactors; is that correct?

Mr. DAVENPORT. No.

The CHAIRMAN. Or just equipment?

Mr. DAVENPORT. Our position in the industry is that of a fuel and components supplier and possibly an operator of a reprocessing plant.

We at the present time are not concerned with the problems that face the reactor suppliers.

Mr. COHEN. It is in connection with our supply of components and fuel elements that we are so seriously concerned with the Government contract provisions of the present bill.

We feel that as worded and as suggested by the Commission they would not cover many aspects of our operation from the product liability point of view.

The CHAIRMAN. Are you in that work at the present time?

Mr. DAVENPORT. We are.

Mr. RAMEY. Has the Commission ever written you saying that they do not have authority under the present law to extend indemnities as far as you would wish them?

Mr. COHEN. We have never received anything in writing to that effect.

However, we have been told this: when we have requested full indemnification in certain specific situations we have been told it at all levels of the Commission.

Mr. RAMEY. Of course, the Commission has a mandatory contract article system of administration where they can put in certain contract articles that each regional office is supposed to follow in its negotiations. I am sure in dealing from the other side of the table that it has been to the advantage of the contractor that an operations office has some flexibility in negotiating contracts.

What you are saying here is that the Commission as a mandatory matter should be told by Congress that they ought to extend these indemnities.

Would that not possibly have some drawbacks also that you would get some things that you do not expect through a mandatory system?

Mr. COHEN. I think there is probably a twofold answer to that question, Mr. Ramey.

On the one hand, as far as the contractor is concerned, the problem of potential liability has now become such a vital issue to those companies who are cognizant of what that potential liability may be that it has pretty much come to the point where we either take the job or we don't, depending on whether we get adequate indemnity coverage from the Government.

This means that under present policy you are permitting the regional office in effect to determine who stays in this industry and who does not.

No. 2, from the public's point of view, if the public is to be protected against potential losses, I would think that it would be in the public interest and that Congress would be interested in ascertaining that the public was protected irrespective of what the different points of view or the bargaining position might be on any contract with respect to any particular regional office.

I want to emphasize and agree completely with what Dr. Davenport said a few moments ago. We are not criticizing the Commission. They honestly believe as they have told us that they have no authority to go beyond giving indemnities that they think they absolutely must give if the job is to be done.

We only point to this as illustration of the problem they feel they are confronted with and the results that have arisen from this.

The CHAIRMAN. Do you receive all the reports or information from the Commission to perform your duties in a way you feel is safe? I mean with respect to radiation hazards?

Why I ask that question is that you said that the Commission at the present time was operating the best they could under the law as they interpreted it. Do you receive all of the information necessary to carry out the duties performed for the Commission?

Mr. COHEN. We do and we, as any other responsible company in this field would do, conform to the very best of our ability to all the health and safety regulations pursuant to information we receive from the Commission.

I don't think we or any other company can claim that we are perfect in the sense that there may not be a human failure at some point. It is the possibility of some human failure and the fact that it may conceivably lead to a reactor excursion and the potentially unlimited liability that might result from that that concerns us.

The CHAIRMAN. We have had such an excellent operation of our reactors, of course, that I feel that information would be highly im-

portant to an operator of any type of facility that produces radiation.

There is no question that based on that information which you receive you still feel, of curse, there is a hazard involved that you should carry more indemnity insurance.

Mr. COHEN. We fell, as Mr. Harrison, Sylvania's vice president in charge of finance, testified last year before the executive session of this committee, that we completely agree that the possibility of a reactor excursion approaches zero if these health and safety standards are adhered to.

However, we also agree that no responsible management would unqualifiedly recommend that its company take a risk for an unlimited period of time, no matter how small the probability of its occurence, if the potential liability involved were unlimited.

Mr. RAMEY. In your comments as to some of the gaps in the insurance policy you mentioned that the policy covers only certain types of injury caused by source, special nuclear or other byproduct material. Does that same comment apply to the coverage of the indemnity bill, as such, which has the language somewhat similar?

Apparently it does not.

Mr. COHEN. Are you referring to the bill or the indemnity policy of the Commission?

Mr. RAMEY. I meant the bill.

Mr. COHEN. I think the bill is fine in this respect. The bill uses the language "caused by," I believe, or "arising from," and I assume the words "arising from" were intended to cover this point.

Mr. RAMEY. I think that was our understanding.

Mr. COHEN. The policy uses the words "caused by" in covering section and "arising from" in the exclusion section.

Mr. RAMEY. That is something that Mr. Haugh may be requested to comment upon at a later time.

The CHAIRMAN. Thank you very much, Mr. Davenport.

Mr. DAVENPORT. Thank you, Mr. Chairman.

(Amplification of Mr. Davenport's testimony follows:)

SYLVANIA-CORNING NUCLEAR CORP.,
Bayside, Long Island, N. Y., April 4, 1957.

Hon. CARL DURHAM,
Joint Committee on Atomic Energy,
United States Senate, Washington, D. C.

DEAR REPRESENTATIVE DURHAM: In my testimony before the Joint Committee on March 27 on the proposed indemnity bills, I outlined a number of areas which we felt the proposed pool insurance liability policy would leave uncovered. One such area which I did not mention at that time, and which has subsequently come to our attention, is the area of product liability of a supplier to the Government.

Paragraph g (6) of the "exclusions" section of the policy excludes from the coverage of the policy any nuclear incident arising out of special nuclear or byproduct material sold or distributed by any insured to the United States of America or any agency thereof, if the bodily injury or property damage occurs after delivery of such material at any premises of the United States of America or any agency thereof, or after arrival of such material at any other premises where it is to be delivered.

Paragraph g (6) would appear to exclude from the coverage of the policy any liability of a supplier to the Government resulting from a defect in any product supplied by him which contains special nuclear or byproduct material. As indicated in the Columbia report, a supplier of a defective product to a reactor might very well be held liable for all of the potential damages resulting from a reactor excursion. While recognizing this fact, it is apparently the intent of

the insurance pool to exclude from the policy all product liability of a supplier to the Government. The insurance pool has apparently reasoned that such liability will or should be covered by a direct indemnity from the Government.

However, as indicated in my testimony, indemnity has in fact been granted by the Commission only in limited instances. Furthermore, the Anderson-Price bill, by its present terms, would not authorize indemnification of all direct suppliers of the Government. Even in those circumstances where indemnification is authorized by the present wording of the bill it is not mandatory. I believe that the terms of the proposed insurance policy and the apparent intent of the insurance pool point up further the necessity for extending the provisions of section 170 (d) of the Anderson-Price bill along the lines suggested in my testimony.

I want to thank you once again for the opportunity of appearing before your committee.

Cordially yours,

SYLVANIA-CORNING NUCLEAR CORP.,
LEE L. DAVENPORT, *President.*

The CHAIRMAN. The next witness is Mr. Arthur Berard, president of the National Electrical Manufacturers Association.

STATEMENT OF ARTHUR BERARD, PRESIDENT, NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

Mr. BERARD. Mr. Chairman and members of the committee. My name is Arthur A. Berard. I am president of the Ward Leonard Electric Co. of Mount Vernon, N. Y., and also president of the National Electrical Manufacturers Association. I appear today on behalf of the members of the National Electrical Manufacturers Association to add their support to the bills introduced by Senator Anderson and Representative Price, S. 715 and H. R. 1981.

The National Electrical Manufacturers Association is an unincorporated trade association with a membership of 563 companies engaged in the manufacture of electrical products of all kinds, from hydraulic turbines to fuses.

These companies are by no means all large ones. Based on the results of a survey recently conducted by the association it is estimated that about 70 percent of our member companies have a net worth of less than $5 million, and about 30 percent of the entire membership a net worth of less than $1 million.

The association is thus truly representative of a considerable segment of the electrical manufacturing industry, and I wish to emphasize that I am here today very much as a representative of the smaller companies in the industry, including my own company, Ward Leonard Electric.

At the very outset I would like to make it clear that I am by no means an expert on liabilities connected with atomic energy. My information concerning the industrial hazards connected with its use comes largely from the final report on Financial Protection Against Atomic Hazards, prepared by the Legislative Drafting Research Fund of Columbia University and published in January of this year.

After reading that report, which I understand is the latest and most authoritative survey available, I have become profoundly concerned about the possible effects of damage caused by atomic hazards on the atomic energy program, the electrical manufacturing industry, and the public.

There are many different kinds of electrical equipment, ranging from alarms through wire and cable, which are, or may be, used in connection with atomic reactors, and I am attaching to this statement for the Joint Committee's perusal a list of that equipment, together with a representative sampling of some of the companies which manufacture it.

The failure or malfunction of almost any one of these electrical components may result in the catastrophe of a runaway reactor or similar hazard in a nuclear system, with damages to person and property which are well nigh incalculable.

The Columbia University report which I have referred to points out that:

> * * * The maximum damage which might be done is unknowable. For the purposes of this report, it is sufficient to assume that it would be of a very high magnitude.

I wish to point out here that the many electrical manufacturers for which I am speaking, as with other manufacturers of nuclear components, occupy a rather special position with respect to this risk of a failure which might cause such awesome damage.

We do not, with a very few notable exceptions, participate directly in the construction of atomic reactors, or facilities for fuel fabrication, fuel processing, and waste disposal. We merely manufacture a variety of component parts which are used, frequently without our knowledge, in assembling the overall system.

Let me illustrate my point:

We are told that nuclear reactors contain an immense amount of radioactive material, and that they are regulated by control and safety rods which are driven in to the nuclear material or taken out to reduce or increase activity or to shut down operation entirely.

We are also told that these rods are controlled by common industrial devices such as pressure switches, undervoltage relays, and push-buttons, devices which are used for hundreds of other purposes in nonatomic industrial operations and which may be freely purchased in the open market, at a relatively low price, and generally without the manufacturer ever knowing or having any particular reason to know that his device is to be used in connection with, or as part of, a nuclear system.

It may be presumed that all reasonable precautions have been taken by the builder or operator of an atomic plant to provide adequate protection to the public against the possibility of catastrophic accidents and that the chance of such an accident is slight. But because atomic energy matters are somewhat secret, it is probable that the manufacturer of an electrical component will not know how, or where, or for how long a product of his manufacture will be used and what safety measures will be adopted.

We do know, however, that if an accident should occur—remote though that possibility may be—the possible damage is almost beyond human comprehension. And such staggering damage might be simply the result of failure on the part of an electrical control or safety device, costing perhaps less than $50, and used in the nuclear system without the prior knowledge of the manufacturer.

The resultant liability of the manufacturer, in the absence of some law limiting liability and providing for indemnification to persons

sustaining injury, would be sufficient to destroy almost any manufacturing concern, not only putting that concern out of business, but also leaving those injured with no source of compensation.

And all this because of the failure of a $50 switch.

Furthermore, since the runaway reactor catastrophe may not be an explosion, when the area is finally decontaminated, the evidence as to what caused the accident may be well preserved.

This, of course, makes it easier to determine who is liable for the damage, and, in a sense, increases the product manufacturer's risk.

As a layman I had always thought that there could be no liability without fault. However, the impartial legal experts who prepared the Columbia University report for the Atomic Industrial Forum, Inc., have pointed out, on page 22, that rules of strict liability, that is, liability even without fault, may be applied to the operators of atomic installations.

They also point out, however, that even if rules of strict liability are not applied, as in the case of suppliers—

> neither the operators nor the suppliers can be certain that in a particular case they will not be held liable, however careful they may be (p. 23).

As the authors of the report have noted, the important fact from the viewpoint of the atomic industry and its suppliers is that—

> a procedure exists whereby liability can be imposed on the operator or a supplier without regard to fault.

Every manufacturer, whether consciously or not, assumes the possibility of some liability as a part of the normal risk of doing business.

However, the loss of life and property which might result from failure in an atomic energy plant is so great that the risk becomes different in kind as well as in degree, and is so profound that mere diligence and care in the manufacturing process cannot be considered as adequate protection against that risk.

Nor is private insurance sufficient to protect either the public or the manufacturer against this risk. In fact, the report accompanying S. 4112 in the 2d session of the 84th Congress, pointed out that:

> The central fact which emerged from those hearings was a striking unanimity of opinion that the liability insurance expected to be available from the insurance industry will not provide adequate protection to the public against the possibility of catastrophic accidents, remote though that contingency may be, and that legislation is needed promptly to remove the deterrent effect which limited insurance protection will have on development of the nuclear-power industry.

I endorse that statement wholeheartedly.

As the committee undoubtedly knows, the Nuclear Energy Liability Insurance Association was formed last spring as an agency through which its members might offer protection against radiation liability hazards. The amount of coverage is expected to be about $50 million per installation, which will cover the liability of the operator as well as all suppliers up to the limit of the policy.

However, it does not presently appear that any liability insurance will be available to the suppliers of component parts against damage to the atomic installation itself. (*See* Heard, Coverage of Liability Risks by Stock Company Facilities, Atomic Industrial Forum Report No. 12, vol. 1, 1956, p. 95.)

In a telegram which I received from Mr .Ramey, I was asked to make available to the Joint Committee information on private insur-

ance rates. I regret that I have no such information and have only heard rumors that it will be high.

My point is, however, that private insurance seems clearly to be fundamentally inadequate. Fifty million dollars of insurance is, of course, a great deal of money. But it dwindles in size to unimportance in comparison with the damage which can result from an industrial atomic catastrophe.

It seems to me therefore that the following dangers are inherent in the present situation:

1. The development of atomic energy for peacetime and civilian use may be impeded because of the reluctance of manufacturers to assume the risk of a fantastic financial liability unless some assurance can be given by the Federal Government that it will indemnify persons injured in atomic catastrophes in the event and to the extent that private insurance is either unavailable or inadequate.

2. Manufacturers of component parts, such as the electrical manufacturers for whom I speak, are being asked to assume this great risk in situations over which they may have no control, since their products may be used in a nuclear system and under conditions of which they have no foreknowledge.

Many of these manufacturers are relatively small companies with limited resources which would be unable to survive the financial consequences likely to follow from the failure of an inexpensive product of their manufacture in a nuclear system.

3. Worst of all, however, is the fact that, because of the inadequacy of private resources, the general public is asked to assume the risk of possible horrible and devastating catastrophe without the likelihood of adequate compensation. No matter how remote this risk may be, it is not one which the citizens of this country should be required to assume.

For these reasons, I, as a representative of 563 small and large electrical manufacturers, urge the passage of Senate bill 715 and House of Representatives bill 1981.

I regret that the redrafts of these bills by the Atomic Energy Commission came to my attention too late for there to be an adequate opportunity for analysis and study.

Basically, however, I support the proposition that this Government, through the Atomic Energy Commission, should agree to indemnify and save harmless any owner, operator, user, manufacturer, or builder of any atomic energy facility constructed under license from the Commission, or of any part of such facility, from public liability to the extent that private insurance coverage is inadequate for that purpose.

I also support wide dissemination of information on reactor hazards, and believe that S. 1684, introduced in the Senate by Senator Anderson on March 21, 1957, would assist in accomplishing that objective.

As I pointed out at the outset of this statement, one of the great difficulties facing manufacturers of the component parts of nuclear systems such as my company and the companies I represent, is our lack of knowledge concerning the hazards to which our products are exposed, and the performance expected of them, when they are used in connection with atomic reactors. Thank you.

The CHAIRMAN. Thank you very much, Mr. Berard.

At the present time, under the conditions that exist, I suppose that many of your electrical companies are furnishing material for the Government?

Mr. BERARD. Yes, they are.

The CHAIRMAN. Are you able to buy indemnity under the present provisions?

Mr. BERARD. The larger companies that are in the reactor business I suppose are fully acquainted with the indemnities available to them, but by and large the membership of our organization is not in the reactor or fuel business, but we are component manufacturers such as relays, rheostats, switches of various kinds, that find their way into these projects of which we as manufacturers have no knowledge. That is one of our primary concerns.

The CHAIRMAN. At the present time under the present policy, of course, you are a manufacturer selling them to a retailer?

Mr. BERARD. It may go to a wholesaler or it may go to an original equipment manufacturer where it is used on a pump or used on some other device.

The manufacturer would have no knowledge that his product was being used in a reactor installation.

The CHAIRMAN. But if it actually does happen after the retailer sold it to the Government you are still responsible?

Mr. BERARD. Yes, sir.

The CHAIRMAN. Thank you very much for your statement.

Mr. BERARD. Thank you, Mr. Durham.

The CHAIRMAN. Our next witness is Mr. Benjamin Sigal, general counsel for the International Union of Electrical Workers.

You may proceed, Mr. Sigal.

STATEMENT OF BENJAMIN SIGAL, GENERAL COUNSEL, INTERNATIONAL UNION OF ELECTRICAL, RADIO, AND MACHINE WORKERS, AFL–CIO

Mr. SIGAL. Mr. Chairman, my name is Benjamin C. Sigal. I am general counsel of International Union of Electrical, Radio, and Machine Workers, AFL–CIO.

I greatly appreciate the opportunity to appear before this committee to present our views concerning Senator Anderson's proposed amendments to the Atomic Energy Act of 1954.

At the time I was preparing these remarks I received word that our views in regard to S. 1684, relating to the establishment of a Committee on Reactor Safeguards, were requested. In our opinion the establishment of a permanent independent Committee on Reactor Safeguards is a matter of major importance and I would like to address myself to that bill, first.

I wish to review, briefly, in the words of the Atomic Energy Commission, the history and function of the present Committee on Reactor Safeguards.

In its 21st seminannual report, issued in January 1957, the Atom Energy Commission stated:

* * * During the first year the responsibility of the Atomic Energy Commission—the Commission took over December 31, 1946—the Commission determined to reinforce the safety evaluations of its own technical staff by drawing

upon the experience and judgment of outstanding scientists and engineers in private enterprise and universities. Accordingly, in June 1947, it established a Reactor Safeguard Committee to advise with the Commission, through the general manager, in reviewing, analyzing, and evaluating the hazards of each proposed new reactor and associated facilities, and of significance modifications of existing reactors and facilities.

Late in 1950, the commission established an additional advisory committee, the Industrial Committee on Reactor Location Problems, which in 1951 undertook to study sites of Government reactors and to evaluate environmental factors of reactor hazards.

In July 1953, the two committees were combined into the Advisory Committee on Reactor Safeguards. This Committee, like its two predecessors, has given invaluable service in the field of reactor safety.

With the advent of a licensed atomic energy industry, safety evaluation of an increasing number and variety of proposed reactors and other nuclear facilities became necessary. In organizing to meet these enlarged responsibilities, the Commission established in April 1955 a reactor hazards evaluation staff as part of the general manager's office.

In October of that year, in recognition of the vital part that hazards evaluation would play in licensing, the staff and its responsibilities were transferred to the Division of Civilian Application which administers the licensing program for the Commission. The staff, composed of experienced nuclear physicists and engineers, and members versed in other branches of science and engineering pertinent to the nuclear industry, reviews and analyzes proposed design and operating procedures of all Federal or non-Federal projects. Their advice and recommendations provide assistance to the Division of Civilian Application in evaluating a project to determine whether or not it can operate at a proposed location without undue risk to public health or safety.

It should be noted that, with the possible exception of some military reactors, every reactor built since the Safeguards Committee was established has been reviewed and approved by this committee. The approval related not merely to the safety of the reactor itself, but to the proposed location of the reactor.

It is evident from the foregoing account that the present Reactor Safeguards Committee plays a much smaller role in hazards evaluations than formerly. The reactor hazards evaluation staff now bears the brunt of making recommendations on the hazards of a reactor, and on the question of whether one can be operated at a proposed location without undue risk to public health and safety.

The Commission now apparently considers it of less importance at least with reference to reactors built under the civilian application program, to—

reinforce the safety evaluations of its own technical staff by drawing upon the experience and judgment of outstanding scientists and engineers in private enterprise and universities.

A consequence of this change of policy is illustrated by the conduct of the Commission in regard to the application of Power Reactor Development Co. for a license under section 104 (b) of the act.

On June 6, 1956, the Reactor Safeguards Committee reported to Mr. K. E. Fields, general manager of AEC, that it had considered the proposed PRDC reactor and reviewed the design of the reactor, the state of information on the nuclear properties and the relation of the reactor to its containment and its site.

The committee declared—

(1) That it believed that there was insufficient information available to give assurance that the PRDC reactor can be operated at this site without public hazard;

(2) That it appeared doubtful that sufficient experimental information will be available in time to give assurance of safe operation of

this reactor unless the present fast reactor program of the AEC is amplified and accelerated; and

(3) That it is impossible to say whether or not an accelerated program would give sufficient information to permit safe operations of this reactor at the Lagoona Beach site within the time schedule presently proposed.

This report was not published at the time it was issued, and strenuous efforts were made to keep it secret although the Commission did not deem it to be classified information.

As this committee knows, AEC withheld this information even from this committee until the matter came out more or less accidentally in a hearing on indemnity legislation last year.

As a matter of fact, the report was not published until October 8, 1956, about 4 months after it was sent to the AEC.

Meanwhile, on August 4, 1956, the Commission issued a so-called conditional construction permit to PRDC. It did so, however, without finding that PRDC was financially qualified, or that the proposed reactor was safe. When it issued its permit, it made no reference whatever to the findings of the Committee on Reactor Safeguards and, of course, gave no reasons for rejecting the recommendations of that Committee. The permit was issued also without giving any public notice, or providing any opportunity for a hearing, prior to the issuance of the permit.

As this committee is aware, several unions, United Automobile, Aircraft and Agricultural Implement Workers of America, AFL–CIO; International Union of Electrical, Radio, and Machine Workers, AFL–CIO; and United Paperworkers of America, AFL–CIO; intervened and filed objections to the granting of this permit within the 30 days permitted by AEC regulations, challenging the legality of the whole procedure.

The Commission granted the intervenors a hearing limited to the questions of whether or not the PRDC will be able to show by the time these proceedings are concluded that it has the financial qualifications necessary, and that there will be sufficient information to assure that the reactor will be safe.

In other words, despite the fact that the permit has been issued, that construction is well underway, and that substantial sums of money have already been committed, the AEC is conducting this proceeding as if the permit has not yet been granted.

This short review highlights two questions; namely:

(1) What should be the role of the Advisory Committee on Reactor Safeguards?

(2) Should a hearing be mandatory prior to the issuance of a permit?

It is an understatement, of course, to assert that atomic energy reactors create a unique safety problem. While on the one hand it is vigorously asserted that power reactors, particularly fast reactors, may on the basis of present knowledge be safely constructed, it is, nevertheless, asserted in the same breath that such reactors may possibly cause a catastrophe whose damages may be counted in the billions of dollars.

Even if this is not an inconsistency, it should be clear that the safety problem of atomic-energy reactors must be handled in a unique

way. This is certainly a situation in which it is imperative that we make assurance doubly sure.

As pointed out above, that was the theory the Commission followed when it first established its Safeguards Committee. It decided then to—

> reinforce the safety evaluations of its own technical staff by drawing upon the experience and judgment of outstanding scientists and engineers in private enterprise and universities.

The need to do so now is no less than it was then. In issuing a permit for the PRDC reactor, AEC has given the go-ahead signal for the construction of a reactor that has never yet been safely operated in a populated area.

As a matter of fact, the only reactor anywhere even resembling it suffered a meltdown in a nuclear accident, an accident which the AEC now strenuously seeks to convert into an experimental incident.

Be that as it may, it is clear that AEC is, and certainly should be, constantly pushing out the frontiers of knowledge in this field.

By the same token, it cannot relax for a moment the safeguards that have been set up to assure the safety of the reactors which are built by private industry. Certainly the procedure which the AEC found satisfactory for the building of scores of experimental and research reactors for itself should be applicable to reactors built by private industry.

Inasmuch as the present Committee on Reactor Safeguards has no specific statutory base, the Commission may alter or abolish it at will. Under these circumstances, it is important that the Committee be created by statute and have its functions defined by statute.

We strongly endorse the principles contained in S. 1684, but think that several clarifying provisions would be helpful. First, the legislation should provide specifically that the Committee on Reactor Safeguards shall consist of outstanding scientists and engineers in the various fields bearing on reactor safety, and that none of the members of the Committee be a full-time employee of the Commission.

It appears to me that some such provisions are essential in order to preserve the independence and integrity of the Committee. I do not suggest, of course, that such independence and integrity have not so far characterized the present Committee. Nevertheless, I think this should be a minimum requirement in the law.

Secondly, there should be a provision that no construction permit or license may be issued until at least 60 days after publication of the report of the Safeguards Committee. Even though there may be a public hearing before the grant of a license, a reasonable period should be allowed for interested parties to study the Committee's report before being required to go to a hearing.

Third, it should be made clear that a report of the Safeguards Committee should be required both prior to the issuance of a construction permit, and prior to the issuance of an operating license.

It may well be that the Committee may consider a given proposal safe and approve the issuance of a construction permit, but change its mind by the time the reactor is ready for operation.

It may be that the Committee will approve a permit on the assumption that information will be available by the time the reactor is ready for operation, but learn later that such information will not be available.

The PRDC reactor is a case in point. The construction permit was issued without a finding of safety, but the Commission and the company insist that this is not objectionable since the reactor will not be licensed unless it is found safe at the time it is ready to operate.

We urge that this bill provide that the AEC may not issue a license to operate without having had the matter reviewed and reported on by the Safeguards Committee.

With respect to the proposal in S. 1684, for a public hearing, we are fully in accord with the objectives of this proposal. Our experience in the PRDC case emphasizes the necessity for the holding of a hearing prior to the issuance of a construction permit.

In our opinion, the Commission gives a hostage to fortune once it issues a permit and authorizes the applicant to make a substantial investment in construction. The probability of the Commission's reversing itself, once construction is well underway, must, except under the most extreme circumstances, be considered highly remote.

Consequently, it appears to us essential that a hearing be held prior to the time a construction permit is issued.

I assume that this is what is intended by the amendment to section 189 (a), as proposed in S. 1684. However, I think it is not clear and should be amplified.

I propose that this section be amended to provide that the Commission shall hold a hearing prior to the issuance of a license, or a construction permit, after 30 days' notice. As it now reads, the amendment would apparently not apply to construction permits.

Furthermore, it does not preclude the holding of a hearing after a license or a permit is issued, which we consider undesirable.

Concluding on S. 1684, I think it is fortunate that Senator Anderson introduced his bill regarding the Committee on Reactor Safeguards at this time, because such legislation is a prerequisite to any indemnity legislation.

Now, with respect to indemnity legislation in S. 715 and H. R. 1981, the preamble to these bills states that the legislation is necessary—

> in order to protect the public, and to encourage the development of the atomic-energy industry in the interest of the general welfare and the common defense and security * * *

If the conduct of AEC in the PRDC case is typical of its present and future attitude with regard to the issuance of licenses for private reactors, even $500 million indemnity will not protect the public. Indemnification will not protect the health and safety of the public; it can only pay for some part of the damage caused by a nuclear accident.

It may be in the interest of the general welfare and of the common defense and security to spread the risk and the cost of nuclear accidents, but it certainly cannot be in the interest of the general welfare and the common defense and security if the existence of indemnification legislation reduces the standard of care exercised in the building of such reactors. We are very much concerned lest that may happen.

Let me direct your attention first to a little episode that appears to have been forgotten. About 2 years ago AEC appointed a group

of 10 insurance executives called the Insurance Study Group. Two of the stated purposes of this group were:

> To develop information and criteria with respect to the insurability of industrial atomic energy installations and undertakings; and
> To make appropriate recommendations to the Commission including any specific legislation that may be considered necessary.

One of the recommendations made by this group in its report, issued on July 13, 1955, was as follows:

> In order to promote the insurability of such enterprises and increase insurance capacity, it is believed absolutely necessary that the present Reactor Safeguards Committee or a similar committee continue to function and that stringent safety standards be maintained as a condition precedent to licensing under the 1954 act. This would involve periodic inspection as to compliance as a condition for the continuance of the license.

It is evident from this recommendation that the Insurance Study Group believed that no insurance should be issued unless a reactor had the approval of the Reactor Safeguards Committee, as it existed and functioned in July 1955.

As already pointed out, that Committee no longer functions as it did in July 1955.

Furthermore, it is evident that the Insurance Study Group did not look upon the recommendations of the Safeguards Committee as being merely advisory. The strong language used can lead only to the conclusion that this group of insurance executives believed that no insurance should be granted unless the Safeguards Committee considered the reactor safe.

The wisdom of this recommendation has been emphasized by the conduct of AEC in relation to the PRDC application. I imagine that your committee would agree that the safety of a reactor cannot be determined by whether or not it has insurance or indemnification.

Nevertheless, that appears to be the attitude of AEC.

For example, on June 29, 1956, Mr. Strauss testified before the subcommittee of the Committee on Appropriations of the House of Representatives on the second supplemental appropriation bill of 1957, part 2, page 331, as follows:

> Then, as Commissioner Murray informed you 2 or 3 days ago, the Reactor Safeguards Committee of the Commission has made a report to the Commission with respect to safety features of the reactor, which report is under study by the Commission at the present time.
> The Commission has not acted upon the subject of the safety aspects of the proposed reactor and the Detroit-Edison Co. and associates are waiting, as are many others interested in this business, on the action that is expected and hoped for from the Congress at this session on the bill to assist in the indemnification of third parties against the possibility of a reactor incident.

Remember, this was about 4 weeks after the Reactor Safeguards Committee had refused to give the PRDC reactor a clean bill of health. Is a reactor any less likely to have a nuclear accident if it is covered by $500 million of indemnity than if it is covered by no indemnity at all? Obviously not.

Nevertheless, it is quite clear that the Commission was apparently prepared to authorize, and subsequently did authorize, the construction of this reactor on the expectation that indemnity legislation would be adopted by the Congress.

We submit that the conclusion is inevitable that the Commission is prepared to take a risk on the public health when there is adequate

indemnification which it would not take in the absence of indemnification.

An attitude of this kind is not in the public interest and cannot be allowed to prevail. Damages to the surviving kin of the dead are not adequate substitutes for the lives that may be lost in a nuclear accident. This seem so trite it should not have to be said. Unfortunately, the facts require us to say it.

I call your attention again briefly to the record in the current hearings in the PRDC case. Further proof that AEC takes it for granted that the PRDC will not continue with its project if it cannot obtain satisfactory insurance may be had from the latest draft of the proposed power demonstration contract between the company and the Commission dated March 8, 1957. Article V, section 2A provides:

> The company or the Commission may terminate this contract at any time by written notice if the company is unable to obtain such license, permits, regulatory and other governmental agency approvals and/or rulings as may be necessary for the performance of this contract, or if the company is unable to obtain satisfactory liability insurance coverage. It is understood that the Commission is not obligated to assist the company in obtaining any of the above.

According to the newspapers that contract was signed yesterday. The company made it abundantly clear, of course, that it will not operate the reactor without such insurance coverage. This bears on the question of financial qualification of PRDC, which in turn has a direct bearing on safety. When PRDC sought to strike from the issues to be considered in the current hearing the question of its financial qualifications, the Commission declared in an opinion on December 12, 1956:

> We are satisfied that the issue of applicant's financial qualifications to engage in the proposed activities bears a sufficiently direct relationship to the issues of safety as to entitle the intervenors to be heard on the issue of financial qualification. We also feel that, apart from any interest of the intervenors, a hearing on the issue of financial qualifications is appropriate in the public interest.

We submit this question to the joint committee. Should any operation be insured or indemnified if it is built and operated on a budget so tight—if not completely inadequate—that the operator may be compelled to introduce unwarranted economies?

That, we believe, is exactly the situation in the PRDC case. The evidence submitted by the company itself shows that if it is obliged to pay taxes in the same way that any business corporation is expected to pay them, it will end up $4 million in the hole when construction of the reactor is completed.

To put it another way, even if we assume that the company's cost estimates prove to be justified, all of their present commitments for contributions and loans total $4 million less than it will take to build the reactor. The company assumed, of course, that it will not have to pay the taxes that other business corporations pay.

For this assumption, however, it relies upon the opinion of tax counsel, which has not been corroborated by the Internal Revenue Service.

In one respect the Internal Revenue Service has already rejected one part of that opinion.

Furthermore, still assuming that the company will have to pay its taxes like any other business corporation, it will come to the end of its 10-year operating period with a surplus of about $600,000. In view of all the contingencies that may eventuate during this period, this is an utterly unsafe margin.

However, in order to arrive at even this very insecure margin, the company is apparently relying on the assumption that it will receive from the AEC payment for the plutonium the reactor produces on a basis other than its fuel value.

Plutonium at fuel value is worth $12 a gram; weapon grade plutonium is worth several times this amount. The actual figure is classified.

Nevertheless, the testimony shows that the PRDC reactor will produce plutonium for which a price will be paid by AEC much higher than $12 per gram.

The price, as the testimony shows, may be well in excess of $40 per gram. It may be fairly inferred from the evidence that PRDC will receive approximately $30 million more for its plutonium production in the 10 years of its expected operation than it would receive for the plutonium at fuel value.

Since, on the most optimistic assumptions of PRDC, it will end up the 10-year operating period with a surplus of about $7 million, it is obvious that PRDC cannot possibly operate without receiving the enormous subsidy from AEC represented by its anticipated high price for plutonium.

All of this relates directly to the safety question. PRDC will be driven at all times by the need to economize. It will have no assets other than what is in the plant itself.

Consequently, if a nuclear accident of substantial size occurs and the plant itself is destroyed, PRDC will have nothing but what it can salvage from the ruins. None of its contributing members has any obligation beyond its explicit written commitment. PRDC has no assets beyond the commitments and the money it expects to borrow.

We consider it highly questionable that a corporation so organized and so financed should be permitted to operate an instrumentality which, no matter how remote the possibility, may cause a catastrophe. We submit that establishing practically unlimited indemnification for a corporate structure of this kind is an invitation to more bizarre holding company financing.

But this is only one facet of a many-sided problem. I will call your attention to only one more piece of highly illuminating evidence that came out during the hearings on the PRDC matter.

Dr. Hans Bethe, company's principal safety consultant, testified at length concerning his opinion on the safety of the reactor. He testified, in effect, that what the company presently proposes to do will be enough to make the reactor safe.

Nevertheless he pointed out several alterations in design which would be added safety factors, and named one in particular which, in his opinion, would guarantee the safety of the reactor. This was the elimination of the so-called lower blanket in the reactor core.

At that point, the following colloquy took place between Dr. Bethe and myself:

Question. With respect to your proposal, namely, the elimination of the lower blanket in order to avoid refreezing, would this insure the elimination of the possibility of a nuclear accident after meltdown?

Answer: This is my opinion.

Question: If that is the case, why is not that made now a part of the design of the PRDC reactor?

Answer: Because we hope to establish that even with the blanket present, the reactor is safe in case of a meltdown. If we do not succeed in establishing this, then I would recommend to retreat to the position of removing the lower blanket.

Question: Then it would appear that inasmuch as you are certain that this would provide the ultimate safety factor, that the reason you do not now recommend it without further tests is that it would seriously affect the economics of the reactor; is that right?

Answer: It would affect the economics, I would say, not too seriously.

Then a discussion took place as to how much money would be involved. Dr. Bethe stated that a rough estimate would be that the total reduction in PRDC income over a period of 10 years would be about $1½ million, if the lower blanket were eliminated.

Then this question and answer followed:

Question. Your belief is, then, that it would be advisable not to make this change now without further tests inasmuch as it might mean a reduction in overall income in a 10-year period to PRDC on the order of $1½ million; is that right?

Answer. That is right.

In other words, in order to save this $1½ million for its anticipated gross income of about $92 million, the company's principal consultant on safety is apparently willing to take whatever risk is involved.

We say that this is an intolerable situation. Dr. Bethe's testimony means, in effect, that the difference in cost between a reasonable amount of safety, and a practical guaranty of safety, is $1½ million gross income in an operation that will gross over $90 million.

I ask you, Mr. Chairman, is it fair and reasonable? Is it in the public interest, that the people of the United States should assume the risk, whatever it may be, of a catastrophe resulting from such a decision?

We submit that the passage of any indemnification law at the present time would be a serious disservice to the atomic energy industry and to the people of the United States. It will mean the taking of risks which should not, and need not, be taken.

We urge this committee to enter upon a thorough examination of the licensing procedures of the Commission to determine whether or not its safety criteria and standards are adequate.

We further urge this committee not to recommend indemnity legislation until it has made such an investigation and satisfied itself that those criteria and standards are satisfactory.

Now, Mr. Chairman, before I close I want to comment on the newspaper report I read this morning, of testimony given before this committee by a representative of the General Electric Co. in which he said, in effect, that so far apparently as his company is concerned, they will stop building what they claim is the largest all-nuclear powerplant scheduled in this country if this Congress adjourns without passing this indemnity legislation.

Now, I think that that statement is unconscionable. It is a threat which should be vigorously rejected by this committee.

I submit under the circumstances Congress should not pass this legislation in view of that kind of statement.

Remember, GE has assets of its own running into the billions of dollars. It is building a reactor which the Atomic Energy Commission itself has said is the safest reactor that can be built, namely, the boiling water reactor, which is now operating near Chicago, Ill., at Lemont, Ill.

The Commission had no compunctions about operating that reactor. The Safeguards Committee had no compunction about approving that reactor for operation in Lemont, Ill.

However, GE, which is building that same kind of reactor, says it will stop unless it gets this legislation, unless its gets $500 million indemnity at least against the possibility of an accident.

Presumably the rest of the industry thinks so, also.

Again, I say that is an unconscionable threat, a blackjack over this committee; and I think it ought to receive the forthwith rejection that it deserves.

Now, in conclusion, Mr. Chairman, I want to summarize my statement as follows:

1. We are in accord with the objectives of the legislation proposed in S. 1684, and recommend its adoption, with the clarifying amendments we have suggested.

2. Indemnity legislation should not be adopted in any event unless the objectives of S. 1684 are accepted by Congress.

3. No indemnity legislation should be adopted until the licensing procedures of the Atomic Energy Commission have been thoroughly investigated and found to be satisfactory with respect to applicable safety standards and criteria.

Now, if I may, Mr. Chairman, unless you desire to ask questions at this point, I would like to introduce Mr. Carlos Gastambidi, who is president of the Industrial Union Council of Monroe County, Mich., the city closest to Lagoona Beach, Mich., the site at which this reactor is to be built.

He has a short statement to make.

STATEMENT OF CARLOS GASTAMBIDI, PRESIDENT, MONROE INDUSTRIAL UNION COUNCIL, MONROE, MICH.

Mr. GASTAMBIDI. I am Carlos Gastambidi. I am president of the industrial union council of former CIO unions in Monroe County, Mich., representing approximately 5,000 working people in the Monroe area. I am an intervenor personally and officially in the PRDC hearing now pending before the Atomic Energy Commission.

I endorse the position taken by my attorney, Mr. Ben Sigal, as he has just stated it here to you.

We in Monroe are concerned about the decision of the Atomic Energy Commission to go ahead with the construction of this reactor even though the AEC's most informed scientific advisers raise questions about its safety.

The local unions in Monroe could not have carried this case themselves. We appreciate the support which the national unions, UAW, IUE, and United Papermakers and Paperworkers Union, have given us in carrying this case.

We know that effort has been made to divide labor on this issue, but we are proud that the AFL–CIO executive council has adopted a statement of support which I would like to submit for the record.

(The information referred to follows:)

STATEMENT BY THE AFL–CIO EXECUTIVE COUNCIL ON ATOMIC BREEDER REACTOR; AUGUST 30, 1956

The issuance of a construction permit for a fast breeder reactor at Lagoona Beach, Monroe County, Mich., by the Atomic Energy Commission shows a complete disregard for the safety of the community. AEC without public hearings and in "star chamber" fashion ignored a report on safety prepared by a special committee of experts. The AFL–CIO Executive Council believes that the atomic reactor program must be broader and the benefits of atomic uses brought to civilians, but the safety of the workers and whole communities cannot be ignored.

Local unions of various international unions and other interested parties are moving to intervene against the construction permit by demanding that the AEC hold public hearings to determine if all safety precautions were taken prior to its issuance.

The AFL–CIO approves and supports these interventions by interested parties and pledges its full support in their efforts to have all the facts aired before construction begins.

Mr. Strauss said before the Appropriations Committee last year that the Atomic Energy Commission has not acted on the subject of safety and will not until the Congress passes the bill you are now considering.

I urge you not to pass the bill until the safety of the Monroe reactor has been determined.

Mr. Chairman, unless you have any questions I would like to introduce from Monroe the president of Local 1000 of the Paperworkers and Papermakers of America, Mr. Joseph Stanifer.

Mr. Chairman, I wish to thank you for the opportunity of appearing before your committee.

STATEMENT OF JOSEPH R. STANIFER, PRESIDENT, LOCAL 1000, UNITED PAPERMAKERS AND PAPERWORKERS UNION OF AMERICA

Mr. STANIFER. I am Joseph R. Stanifer, president of local 1000, representing 650 paperworkers in Monroe County.

I greatly appreciate the opportunity to appear before this committee.

Many of our members live with their families near the Lagoona Beach area itself. I am deeply concerned about the extent of damage that an unsafe reactor might cause.

It is clear that the proposal in these pending bills of a possible accident would obligate the Federal Government to, at least, $500 million. This amount of insurance would not be necessary if it were not possible that a tremendous catastrophe can take place.

We at Monroe are more concerned about the safety than getting insurance payments if all of our families are destroyed.

During last year's hearings on governmental indemnity before this committee, on page 158, it was revealed that some informed sources thought: "The damage"—of a serious nuclear reactor accident—"can run to $5 billion."

The AEC report filed with this committee on "Theoretical Possibilities and Consequences of Major Accidents in Large Nuclear Powerplants" says on page 3 of the covering letter:

> * * * the upper limit in the worst case of about $7 billion.

We in Monroe are less concerned about the liability and insurance payments than we are about the safety of this reactor under construction.

We hope this committee will insist on determining the safety before putting the responsibility for a reactor accident on the Federal Government.

I thank you.

Now, I would like to present the president of local 1004 and vice president of the Michigan CIO Council, Mr. John Jennings.

The CHAIRMAN. Mr. Jennings.

STATEMENT OF JOHN JENNINGS, PRESIDENT, LOCAL 1004, UNITED PAPERMAKERS AND PAPERWORKERS UNION OF AMERICA

Mr. JENNINGS. I am John Jennings, president, local 1004, of the United Papermakers and Paperworkers.

I am also an intervenor in the PRDC proceedings.

Brother Stanifer and I represent the 6 local unions of the United Papermakers and Paperworkers in the Monroe area with a total membership of 2,300.

Shortly after the House Appropriations Committee hearings were released last year, we noted that Chairman Strauss said the design for the fast breeder reactor in Monroe "was the most hazardous of all the reactors."

Since then, I have learned that Commissioner Libby said:

> I think it is worth reiterating that these products are more toxic per unit weight than any other industrially known materials by a factor of a million to a billion * * * but because of the potential hazard to people, and even future generations, it is imperative to face and solve these problems.

After the Commission acted on the construction permit for Detroit-Edison, Commissioner Murray issued a statement saying that:

> Today (August 4, 1956) Commissioner Murray refused to approve issuing a conditional construction permit to the Power Reactor Development Co. The Advisory Committee on Reactor Safeguards has not modified its letter dated June 6, 1956, to the Commission. Unless the Committee changes its position as stated therein, Commissioner Murray believes that issuing a conditional construction permit is not warranted.

Mr. Chairman, I know that I speak for the members of our local unions when I say that we are concerned about the future of this reactor not only for ourselves, but for our families and the future race.

I am a grandfather. I am more concerned about my grandchildren in Monroe than I am for myself.

The question here is not whether this reactor is safe during the period of construction, although I now understand that the reactor will be started up during the so-called period of construction.

The real question is what AEC will do after Detroit-Edison has spent $40 million. If they find it unsafe at that point, the AEC is just as apt to take a chance as they have taken a chance in letting construction get started.

I hope this committee will not do anything that will encourage completion of this plant until its safety has been proved.

I thank you.

The CHAIRMAN. Thank you very much, gentlemen.

I might say for your benefit that the staff and the committee has made a study of the license procedures. That report will be ready within a short period of time.

(NOTE.—The report referred to, entitled "A Study of AEC Procedures and Organization in the Licensing of Reactor Facilities," has been published as a Committee Print and may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.)

I have here statements from the following companies: American Gas & Electric Co., American Public Power Association, Chamber of Commerce of the United States, Commonwealth Edison Co., Consolidated Edison Co. of New York, Inc., Edison Electric Institute, National Association of Insurance Agents, National Rural Electric Cooperative Association, Pennsylvnia Power & Light Co., Pennsylvania State University, Power Reactor Development Co., Steel Plate Fabricators Association, Westinghouse Electric Corp., and the Yankee Atomic Electric Co.

Without objection, I will place them in the record at this point.

(The statements referred to follow:)

AMERICAN GAS & ELECTRIC CO.,
New York, N. Y., March 26, 1957.

Hon. CARL T. DURHAM,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States, Washington, D. C.

DEAR MR. CHAIRMAN: This letter is in response to the Joint Committee's invitation of March 12 to present views on proposed legislation providing for governmental indemnity against reactor hazards.

The American Gas & Electric System has been actively participating in the nuclear-power program for the past several years. It has been a member of the Nuclear Power Group since its formation, which group is participating in the Dresden project near Chicago. I understand that Mr. Willis Gale, chairman of Commonwealth Edison Co., who is now president of Nuclear Power Group, Inc., is submitting a statement to your committee on behalf of NPG and that Mr. Francis K. McCune, vice president of General Electric Co., the contractor for the Dresden plant, intends to appear before your committee to present his views.

American Gas has also become a member of a recently formed group of companies operating in the East Central portion of the United States, whose members are:

American Gas & Electric Service Corp., New York, N. Y.
The Cleveland Electric Illuminating Co., Cleveland, Ohio
Columbus & Southern Ohio Electric Co., Columbus, Ohio
The Dayton Power & Light Co., Dayton, Ohio
Indianapolis Power & Light Co., Indianapolis, Ind.
Louisville Gas & Electric Co., Louisville, Ky.
Monongahela Power Co., Fairmont, W. Va.
Ohio Edison Co., Akron, Ohio
Pennsylvania Power Co., New Castle, Pa.
The Potomac Edison Co., Hagerstown, Md.
Southern Indiana Gas & Electric Co., Evansville, Ind.
West Penn Power Co., Greensburg, Pa.

This group proposes to carry out a comprehensive program of nuclear research and development, including construction of a small prototype, of an advanced reactor concept. The details and objectives of this program were set forth in my letter to you of February 18, 1957.

This letter is being submitted by me as chairman of the group's working committee.

I appeared before your committee in March and, again, in May, and submitted a statement to your committee in June, of last year. In those appearances and in my statement, I expressed the view that the third party liability problem represented a major obstacle in the path of our country's nuclear-power program. I strongly urged the enactment of legislation providing for governmental indemnification along the lines of bills introduced for that purpose by Senator Anderson and Representative Price.

Everything that has developed and everything that we have learned in the past year strengthens my views in this respect. It is clear to me that the possibility of a nuclear catastrophe is remote. But it is equally clear that governmental indemnification legislation is a necessary condition precedent to extensive nuclear-power development and is essential to protect both those associated with such development and the public. I believe that S. 715, introduced by Senator Anderson, and H. R. 1981, instroduced by Representative Price, will provide a workable solution of the liability problem. I strongly urge prompt enactment of such legislation.

A word should be said about private insurance which the proposed legislation properly contemplates would be utilized where it is available on reasonable terms.

In the light of our limited knowledge and experience in the atomic field, the insurance industry has done a highly commendable job in the progress it has made in this field, but the information made available to date raises some question as to the adequacy of the coverage which will be provided and as to whether the proposed rates are realistic. We need to be sure that there are no substantial gaps between the coverage afforded by private insurance, the financial protection otherwise provided, and governmental indemnification. And it would be most unfortunate if unrealistic rates for insurance were to materially affect the economic feasibility of nuclear power reactors and thus impede the program.

I have every hope and expectation that time and experience will enable the insurance industry to work out an acceptable solution of any such problems. In any event, S. 715 and H. R. 1981 seem to me to provide the necessary flexibility and framework within which such problems can be dealt with without detriment to the primary objective of encouraging nuclear power development by providing protection for those associated with such development and the public at large.

In accordance with what I understand to be the committee's preference, I am submitting this statement for the record rather than requesting an opportunity to appear personally. If, however, the committee so desired, I would, of course, be glad to appear before it.

Very truly yours,

PHILIP SPORN.

AMERICAN PUBLIC POWER ASSOCIATION,
Washington, D. C., March 27, 1957.

Hon. CARL T. DURHAM,
Chairman, Joint Committee on Atomic Energy,
United States Capitol, Washington 25, D. C.

DEAR MR. DURHAM: Thank you very much for your letter of March 12, 1957, to Mr. William S. Peterson, offering the American Public Power Association an opportunity to testify on H. R. 1981 and S. 715, providing for governmental indemnity for third party liability arising out of reactor hazards.

Mr. Peterson, as you know, testified on this general subject at some length before the joint committee on May 17, 1956. Although this association continues to have a direct interest in this subject, we do not have a great deal to add to Mr. Peterson's testimony of last year. Accordingly, we have not requested an opportunity to testify but I do ask that this letter be made a part of the record of the hearings on H. R. 1981 and S. 715.

Our comments on these identical bills are summarized below:

1. A Government insurance or indemnity program appears to be necessary if any non-Federal nuclear powerplants are to be built.

2. We believe the upper limit of $500 million on the Government indemnity coverage is inconsistent with a policy of full reparation to the public for damages suffered and favor removing this limit.

3. Rather than limiting the indemnity protection to be afforded the public, we strongly recommend limiting the risk of nuclear accidents. This could be accom-

plished by amending H. R. 1981 and S. 715 to require that the Atomic Energy Commission restrict the location and control the design of reactors and containment structures so as to limit the maximum potential damage in the event of a major accident.

For example, it would seem desirable during the next several years for AEC to refuse to license large nuclear powerplants to be located in or adjacent to large metropolitan areas. The purpose of these early plants is to advance the technology of plant design and operation. This purpose can be served just as well if the demonstration projects are some considerable distance from large centers of population. Transmission over long distances, up to about 300 miles, of the power produced is quite feasible.

Although AEC now can control the siting of nuclear powerplants under its licensing powers, we recommend that the importance of limiting the risks be explicitly recognized in any Government indemnity legislation. We accordingly urge that H. R. 1981 and S. 715 be amended by adding the following language at the end of section 170c:

"To protect the Government and the public against unnecessary risks, the Commission shall not issue a license under section 103 or 104 or a construction permit under section 185 unless the Commission can make a clear and positive finding that the design of the proposed facility gives reasonable assurance of safe operation and unless the location of the facility is sufficiently removed from large population centers that a major nuclear incident would not endanger large numbers of the public."

4. Federal indemnity protection should be extended only on the condition that the technical information resulting from the indemnified project becomes publicly available. The purpose of providing Federal insurance is to accelerate the development of the atomic energy industry. This purpose could be severely limited if patent monopolies were to result from these early projects. Federal insurance represents Federal aid and should not result in special benefits to selected groups. To avoid Federal assistance to the growth of patent monopolies, it is recommended that the extension of Federal indemnity coverage to any project be regarded as an "arrangement or other relationship with the Commission" under section 152 of the Atomic Energy Act of 1954.

5. In his testimony last year, Mr. Peterson suggested as an alternative to the approach represented by H. R. 1981 and S. 715 that the Government assume the entire public liability risk on private projects during an initial 10-year period, and then expect the insurance industry to have accumulated enough information to begin to take over the insurance function. This still appears to be the most straightforward solution. For one thing, H. R. 1981 and S. 715 will add to the Commission's already enormous powers the authority to tell each licensee how much private insurance he must carry, subject only to some highly general criteria. Furthermore, there apparently will be only one source of supply for liability insurance. The licensee thus will be forced to buy as much insurance as AEC requires at whatever rate the one syndicate establishes. This hardly resembles "free competitive enterprise."

Although we would prefer the approach suggested by Mr. Peterson, we do not object to H. R. 1981 and S. 715 if amended to remove the upper limit on coverage and to require AEC to limit the risk of accidents.

6. Finally, Federal indemnity coverage at the rates proposed should be explicitly and publicly recognized as a Federal subsidy to private industry. Unless this and the other types of Federal subsidies to the nuclear-power industry are so recognized, there is the danger that they will be continued indefinitely and that the private nuclear-power industry never will reach the point of standing on its own feet, economically speaking.

Your letter also requested comments on "the desirability of the public availability of reactor hazard reports." We feel very strongly about this and the associations' general manager, Alex Radin, has corresponded with the Atomic Energy Commission on this subject. Mr. Radin's letters and the reply from the AEC are attached. Since they are not long, I request that they be made a part of this record.

As Mr. Radin's letters indicate, the association believes that reactor hazard reports should be made public, including those by the Advisory Committee on Reactor Safeguards. If ACRS did not exist, then we would favor establishing such a group in order to obtain objective, disinterested and expert evaluations. Otherwise, how are the residents of the communities and States which could be affected by a major reactor accident to have an informed judgment on the safety aspect of a given nuclear-energy project?

While it is true that the sponsors of a project and the AEC can be expected to publish information and judgments on probable project safety, it is no reflection on either to point out that in many instances they are interested parties—"partners" in the project. Despite the best possible intentions, this fact could affect their objectivity in publicly evaluating potential hazards.

Furthermore, I am unable to understand why the Advisory Committee reports should not be made public. The Commission's reasons, as stated in Mr. Price's letter to Mr. Radin, do not seem particularly compelling.

If the committee expects to request further comments from witnesses after the hearings are concluded, I would appreciate a similar opportunity to comment in light of the testimony given during the hearings.

The American Public Power Association is very much interested in the atomic energy insurance problem and appreciates this opportunity to express its views. Our decision to submit this letter for the record rather than testify implies no lack of interest but simply a desire to cooperate with the joint committee in keeping the hearings brief.

Sincerely,

SAMUEL B. MORRIS,
Chairman, Atomic Energy Committee.

P. S.—I understand that the Atomic Energy Commission has proposed an amendment to S. 715 which would eliminate from section 170 (b) the cost and terms of private insurance as one of the criteria to be considered by AEC in establishing the amount of private insurance to be carried by the licensee. If S. 715 is to be the approach adopted to the liability insurance problem, we would oppose the Commission amendment. The cost and terms of private insurance seem to us to be necessary criteria, and of particular importance in connection with small- and intermediate-size nuclear powerplants.

AMERICAN PUBLIC POWER ASSOCIATION,
Washington, D. C., November 16, 1956.

UNITED STATES ATOMIC ENERGY COMMISSION,
Washington, D. C.
(Attention: Mr. Harold Price, Director, Division of Civilian Application.)

DEAR MR. PRICE: On behalf of the American Public Power Association, I should like to submit for your consideration comments on one subsection of the proposed Commission rule on public records (pt. 9).

My comments have to do with subsection 9.4, which defines the types of documents which are not to be included in the public records. Paragraph (c) of subsection 9.4 states that among the documents not to be included in the public records are:

"(c) Intraagency and interagency communications, including memoranda, reports, correspondence, and staff papers prepared by members of the Commission, AEC personnel, or by any other Government agency for use within the AEC or within the executive branch of the Government."

While recognizing the practical necessity for some limit on the intraagency and interagency documents which are to be placed in the public record, I believe that there are strong objections to the total a priori exclusion of such documents from the record.

There surely will be instances when a document of one of the types listed in paragraph (c) will have a direct effect on Commission proceedings, such as a licensing action, and where public access is necessary and desirable for applicants, other parties at interest, and the general public.

The proposed language would exclude, for example, the reports of the AEC Advisory Committee on Reactor Safeguards. Public access to such reports seems necessary because they are highly relevant to license proceeds and could have a direct effect on Commission action on a license application. In some cases only such reports might disclose to other parties that they had an interest in the proceedings. There is also a further reason. The members of an advisory board are regularly employed by private organizations and only occasionally and sporadically employed by the Federal Government. It is no reflection on the members of such boards to point out that occasions may arise where one or more will have divided loyalties in connection with a specific proceeding. If advisory

boards are to continue to be used in connection with license proceedings, then surely their reports should be part of the public record in order to assure that they continue to function impartially and responsibly.

These same remarks apply with equal force to a report or opinion rendered in respect to a specific proceeding by a consultant to the Commission.

It seems probable that there will be times when other intra-agency documents, such as an opinion of the AEC General Counsel (other than those covered by subsection 9.3 (c), should be publicly available in fairness to an applicant for a license or other parties at interest.

The proposed exclusion of interagency communications means, I assume, that if the Federal Power Commission, for example, had an interest in some particular proceeding its opinion might be excluded from the public record. It is difficult to understand the justification for a rule which could have this effect. In this connection, it is of interest to note that where Congress by law required reports on license applications by the Attorney General, under section 105 (c) of the Atomic Energy Act of 1954, in respect to possible violations of the antitrust law it also required that "such advice shall be published in the Federal Register." Where Congress specifically required an opinion by another agency on a proceeding, it also required the Commission to make this opinion available to the public.

I am sure you would agree that it is desirable for the Commission to make earnest efforts to place as much information in the public record in respect to its regulatory activities as it can, in order to increase the ability of prospective licensees and the general public to become informed in a new and important field and to provide increased assurances that the public business is being conducted with a maximum of openness and candor. Subsection 9.4 (c) of the proposed rule does not appear to face in this direction.

Sincerely,

ALEX RADIN.

UNITED STATES ATOMIC ENERGY COMMISSION,
Washington, D. C., March 7, 1957.

Mr. ALEX RADIN,
General Manager, American Public Power Association, Washington, D. C.

DEAR MR. RADIN: In response to the invitation published with the Notice of Proposed Rulemaking, 10 Code of Federal Regulations, part 9, "Public Records," which appeared in the Federal Register on November 3, 1956, you were kind enough to present your comments in a letter dated November 16, 1956. In addition to my acknowledgment of December 19, I should like to reply in some detail to your comments on part 9.

Your principal comment deals with the effect of section 9.4 (c), which excludes from "public records" intra-agency and interagency communications, in creating a "total a priori exclusion of such documents from the records;" and you cite as an intraagency communication which ought to be made public, the reports of the Advisory Committee on Reactor Safeguards. We feel that even though members of this committee devote only part of their time to AEC work, the ACRS reports are no more public records than are materials developed by full-time AEC employees. We are dealing with the matter of conflicts of interest by assuring that our consultants are fully advised as to the permissible extent of private activities which might impair the objectivity of their advice to the AEC in licensing matters.

The exclusion from public records of interagency and intraagency communications, as set forth in section 9.4 (c), is limited to communications which are "for use within the AEC or within the executive branch of the Government." A communication submitted to the AEC by another agency as a party or intervenor, or a formal opinion required by regulations, would be a public record within the meaning of part 9.

Thank you for taking the time to comment on part 9. You may be sure that this regulation and future versions will profit by your attention.

Very truly yours,

H. L. PRICE,
Director, Division of Civilian Application.

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AMERICAN PUBLIC POWER ASSOCIATION,
Washington, D. C., March 21, 1957.

Mr. H. L. PRICE,
Director, Division of Civilian Application,
United States Atomic Energy Commission, Washington, D. C.

DEAR MR. PRICE: Thank you for replying on March 7, 1957, to my letter of November 16, 1956, commenting upon AEC's proposed rule on "Public Records," which has since gone into effect.

I strongly idsagree with the Commission's view that the reports of the AEC Advisory Committee on Reactor Safeguards should be withheld from the public. Your letter states that the Committee's reports are "prepared in the interest of the AEC." This seems to imply that AEC is a private agency whose business is private; that there is some distinction between the "interest of AEC" and the interest of the public. Although I am sure you recognize that AEC exists to serve the public interest and that AEC's business is public business, except where military security overrides, your comments on what should be in the public record do not seem to reflect such recognition.

I think it is clear that the Advisory Committee reports on specific projects where license applications are pending are in an entirely different category from reports made by full-time AEC staff. The Advisory Committee is an outside group of experts and its reports can be fairly regarded as objective, disinterested, and expert views. The public has the right to know what the objective opinion is in any particular proceeding. I think AEC is quite mistaken in feeling "that ACRS reports are no more public records than are materials developed by full-time AEC employees." It is axiomatic that an advisory committee's reports have a different status than reports by regular agency employees.

The PRDC case is an excellent example of why the Advisory Committee reports should be made public. The ACRS report in this case provided information nowhere contained in the AEC public statements in respect to the PRDC application. Release of the ACRS report, following its mistaken suppression, added very substantially to the public understanding of the status of this project and of breeder reactor technology.

I am unable to understand why the Commission believes that it should have the benefit of the ACRS views but that the public should not. This view seems to reflect a paternalistic philosophy that is altogether inappropriate to public administration in a democratic society.

I urge that the Commission reconsider its position, as it did in the PRDC case, and revise its rule to provide that ACRS reports on projects involved in regulatory proceedings be made public at the time they are submitted.

Sincerely,

ALEX RADIN.

CHAMBER OF COMMERCE OF THE UNITED STATES,
Washington, D. C., March 27, 1957.

HON. CARL T. DURHAM,
Chairman, Joint Committee on Atomic Energy,
United States Capitol, Washington, D. C.

DEAR MR. DURHAM: The Chamber of Commerce of the United States endorses S. 715 and H. R. 1981. with a modification, relating to indemnification arising from an unanticipated atomic incident.

The national interest requires rapid development of atomic energy, within our American system of private enterprise. There are serious deterrents to such development, some of which can be remedied by legislative action. One such deterrent has been uncertainty facing prospective operators of civilian atomic power reactors concerning potential liability to third parties, which could arise from an unanticipated atomic incident.

The Joint Committee on Atomic Energy held extensive hearings in the 2d session of the 84th Congress on this problem. In general, the business community was gratified by the bill prepared by the Joint Committee as a result. We regret that the bill was not acted upon by the Congress.

Testimony presented to the Joint Committee has emphasized the urgency of this type of legislation to remove the roadblock standing in the way of atomic energy development.

The Federal Government should undertake to indemnify private manufacturers, operators, and others engaged in atomic activity for liabilities to third

parties incurred in excess of the amount covered by private insurance, resulting from an atomic facility incident. Such indemnification should only be available for amounts in excess of amounts of insurance required by the Atomic Energy Commission based on its evaluation of the hazards involved. If the amount of private insurance available from year to year is less than the amount required by the Atomic Energy Commission, the indemnification should take effect at that point.

To its maximum capacity, except as provided above, private insurance should be utilized in providing coverage of the liability of reactor operators and suppliers of component parts, and within such capacity, Government indemnification or intervention is opposed.

The Government's participation should avoid duplication of services and agencies; therefore, the Atomic Energy Commission should administer the Government's program. The Commission should be empowered within legislative standards stated as explicitly as possible under the circumstances to negotiate for, and utilize fully, on the basis of reasonable cost, the services and facilities of the insurance industry in the issuance of agreements and the investigation and settlement of claims.

In general, S. 715 (H. R. 1981) seems to effectively meet the urgent need to remove deterrents to development of atomic energy and the national chamber favors its enactment. We offer a suggestion for improvement in the legislation, which we believe necessary to avoid an undesirable effect, yet in no way altering the fundamental purposes of the bill.

One of the criteria for determining the amount of financial protection to be required by the Atomic Energy Commission is the "cost and terms" of private insurance. This appears in section 4, adding section 170 (b) to the Atomic Energy Act of 1954, as amended. This provides that the AEC shall consider the cost and terms of private insurance as one of the factors in determining the amount of financial protection required. This would put the AEC in position to have a serious impact on insurance ratemaking procedures. These functions are already fully regulated by the various State insurance supervisory agencies. House Report No. 2531 of the 84th Congress, 2d session, on H. R. 12050 stated on page 11:

"* * * The reference to the cost of insurance in this subsection is not intended to encourage the Commission to undercut the amounts of private insurance provided *at reasonable rates*. Since the program is so new, and no rates are yet established, the Commission must be in a position to set the amount of financial protection required at an amount lower than amount of private insurance offered *if the rates appear high* and all other factors indicate a lower amount is appropriate. Instead, it is merely to give the Commission a chance to look at the economics of the operation of the particular kind of reactor in deciding the amount of financial protection which may be required." [Italic added.]

This criterion would place upon the Commission authority—possibly a responsibility—to sit in judgment as to what shall constitute "reasonable rates. Rates are established by procedures conforming to the requirements of State law, and without Federal intervention, as here suggested. This should remain undisturbed and, therefore, the national chamber recommends deletion of this part (1) of the criteria in the added section 170 (b).

In the light of the foregoing, the national chamber strongly urges enactment of S. 715 and H. R. 1981 to stimulate the private development of atomic energy.

Cordially yours,

CLARENCE R. MILES.

COMMONWEALTH EDISON CO.,
Chicago, Ill., March 20, 1957.

Hon. CARL T. DURHAM,
Chairman, Joint Committee on Atomic Energy,
Washington, D. C.

DEAR MR. DURHAM: I appreciate your invitation of March 12, to make a statement on H. R. 1981 and S. 715 relating to governmental indemnity for third-party liability arising out of reactor hazards.

Members of your committee who are familiar with my previous testimony on this subject know that we of Commonwealth Edison Co. and nuclear power group were strongly in favor of the Joint Committee indenmity bill introduced at the last session of Congress. We have not changed our minds.

We were deeply disappointed last summer when the bill did not come up for consideration. We felt that the bill afforded a sound and workable solution to the problem of the catastrophe risk. We feel the same way today.

The present Anderson-Price bill is substantially the same as last years' bill. We urge favorable consideration of this legislation at the earliest possible moment.

I have these further comments:

First, we recommend no changes in the indemnity legislation as now proposed.

Second, the tentative premium rates quoted by the insurance industry to cover the ordinary third-party liability ticks are considerably higher than we had anticipated in figuring the economics of our project. For example, the initial annual premium would be $250,000 for $50 million of liability coverage. However, we plan to try to live with the rates as quoted. We are taking this position because we believe that if our plant turns out to be as safe as we are conviced it will be, we have full confidence that the rates will be greatly reduced as operating experienced is gained.

Third, our safety studies confirm our long-standing belief that the possibility of a major nuclear incident is extremely remote insofar as our project is concerned. Most experts seem to agree that, regardless of the type of reactor, the chances of a major nuclear incident are substantially zero. For example, the members of the committee who saw the recent dedication at Argonne National Laboratory witnessed a demonstration of the self-limiting features of the boiling-water type of reactor.

In order to accelerate the atomic power program, we strongly recommend that the indemnity bill be passed at once. The bill is so important to the public interest and has such universal approval that it should be considered strictly on the basis of its own merits and not be tied up with any other legislation.

Sincerely yours,

WILLIS GALE, *Chairman.*

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.,
New York, N. Y., March 21, 1957.

Hon. CARL T. DURHAM,
Chairman, Joint Committee on Atomic Energy,
Washington, D. C.

DEAR MR. CHAIRMAN: I have noted with interest your announcement of March 12 indicating further consideration by the Joint Committe of proposed legislation for governmental indemnity against reactor hazards.

When I appeared before your committee last year on May 16 I said that we would welcome such legislation and would be glad to cooperate in any procedure established by Congress. We later expressed support of S. 3929. I am advised by counsel that H. R. 888, S. 715, and H. R. 1981 of the current Congress are substantially the same as that bill which was favorably reported by the committee last year.

It is evident that enactment of the proposed legislation becomes more important as the time approaches for operation of power reactors not owned by the Government.

Respectfully yours,

H. R. SEARING, *Chairman of the Board.*

EDISON ELECTRIC INSTITUTE,
New York, N. Y., March 28, 1957.

Hon. CARL T. DURHAM,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States, Washington, D. C.

DEAR MR. DURHAM: The committee on atomic power of the Edison Electric Institute notes from the Joint Committee's announcement of March 12 that the Joint Committee currently is conducting hearings with respect to proposed legislation providing for governmental indemnity against reactor hazards.

On May 16, 1956, Mr. E. L. Lindseth, on behalf of the Edison Electric Institute and its committee on atomic power, made a statement before the Joint Committee in support of legislation providing for governmental indemnity. We understand that the bills currently under consideration by the Joint Committee on the subject of governmental indemnity are essentially the same as

the bill which was favorably reported by the Joint Committee in 1956. We continue our belief that enactment of the proposed legislation is necessary and would have a favorable effect on the progress of the power industry in developing and building nuclear power reactors. Accordingly, we are pleased to advise that we favor enactment of the proposed legislation for governmental indemnity against reactor hazards.

Respectfully yours,

E. H. DIXON, *Chairman.*

NATIONAL ASSOCIATION OF INSURANCE AGENTS,
New York, N. Y., March 25, 1957.

Re Amendments to the Atomic Energy Act of 1954—S. 715 and H. R. 1981, 85th Congress, 1st session

Hon. CARL T. DURHAM,
Chairman, Joint Committee on Atomic Energy,
United States Congress, Washington, D. C.

DEAR MR. CHAIRMAN: This representation is made on behalf of the National Association of Insurance Agents, a voluntary membership association numbering in excess of 32,000 insurance agency members. Included in this membership are over 100,000 individuals, duly licensed by the respective States, who are proprietors, partners, or corporate principals in the firms and corporations which comprise said insurance agency members. This organization is comprised of independent businessmen who specialize in the production and servicing of policies of fire, casualty, surety, marine, and all other lines of general insurance for clients ranging from the smallest householder or automobile owner to the largest industrial corporation.

A number of insurance agencies are vitally interested in the development of insurance coverage for commercial uses of atomic energy. While development of atomic energy has not as yet reached the point of universal concern to all members of this association, it is expected that in years to come this form of energy will affect virtually all insurance agents, as it will the general public as a whole.

This association commends the efforts of the Joint Committee on Atomic Energy in encouraging the widespread development of commercial nuclear energy, and most earnestly recommends to the Joint Committee that it continue its recognition of the vast and universal potential of nuclear energy and its future effect upon all segments of the American economy.

In this connection, we urge that in your consideration of S. 715, introduced by Senator Anderson, and H. R. 1981, introduced by Representative Price, there be inserted a provision in section 170g, or in some other appropriate place, authorizing the Atomic Energy Commission to use the facilities and services of insurance agents and brokers to the extent that it may be necessary or desirable to utilize such services, and that reasonable compensation be authorized for such services.

Agents and brokers who consummate and maintain insurance protection for companies which are directly concerned with commercial uses of atomic energy are accustomed to deal with the entire insurance program of a particular assured. In doing so these agents and brokers become familiar with a good many facets of the practical operation of the firms which they insure. It is entirely conceivable that the Atomic Energy Commission may, in certain cases, have a real need for the services of these agents and brokers.

It is recognized, of course, that there would be no prohibition to use the services of agents and brokers in any bill such as the Anderson bill, S. 715, and the Price bill, H. R. 1981. However, since the authorization to use the services of private insurance companies and insurance adjustment organizations is specifically spelled out in S. 715 and H. R. 1981, we believe that it would also be in order to provide authorization for use of the facilities of agents and brokers to the extent necessary or desirable in the opinion of the Commission.

This organization believes that such a permissive authorization would be in the best interests of the Atomic Energy Commission and of the insuring public. Your consideration of this recommendation will be deeply appreciated.

Yours sincerely,

ROBERT E. BATTLES, *President.*

STATEMENT OF CLYDE T. ELLIS, GENERAL MANAGER, NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION

Mr. Chairman and gentlemen of the committee, my name is Clyde T. Ellis. I am general manager of the National Rural Electric Cooperative Association. NRECA is the national service organization representing 92 percent of the operating rural electric systems in the United States (including Alaska). These systems serve about 3,823,678 farm families and rural establishments.

It is the responsibility of our association to assist our member rural electric systems in securing adequate insurance protection at the lowest possible cost.

I appreciate the opportunity afforded by the Joint Committee to appear before you to discuss the atomic reactor insurance problems which we are encountering.

INTEREST IN ATOMIC POWER

Our interest in atomic power projects and the insurance protection of these projects is extremely great. Our loads are doubling every 5 years, thus creating ever-increasing need for a greater power supply. Our atomic energy study group received final approval from AEC on March 18, 1955. There have been several meetings of the full study group with officials of the Army Corps of Engineers, the AEC, and private industry, to discuss the work they are doing in the development of power reactors. Members of the group also made visits to various AEC installations such as Oak Ridge, Argonne, Arco, and Shippingport, Pa. We feel that the activities of the study group have been responsible for bringing to the attention of the rural electric systems the new developments of the rapidly changing field. We also feel that the study group has been responsible to a great extent for the proposals which were received from the rural electric systems by the AEC under their small-scale demonstration power reactor program.

The three current proposals submitted by rural electric cooperatives under AEC's small-scale program are evidence that the rural electric systems are tremendously interested in atomic power. These three cooperatives are:

(1) Rural Cooperative Power Association, a federated generation and transmission cooperative at Elk River, Minn., which submitted a proposal for a 22,000-kilowatt boiling water reactor;

2. The Wolverine Electric Cooperative, a federated generation and transmission cooperative at Big Rapids, Mich., which submitted a proposal for a 10,000-kilowatt aqueous homogenous reactor; and

3. Chugach Electric Association, Inc., a distribution cooperative at Anchorage, Alaska, which submitted a proposal for a 10,000-kilowatt sodium-cooled, heavy water moderated reactor. These rural electric cooperatives are in some of our highest cost power areas. These high power costs, of course, account in a large part for the keen interest of our systems in atomic power.

HAZARDS AND PROTECTION

We have disagreed in the past, as previous testimony will show, with the conclusions reached by the McKinney panel in the section entitled "Hazards, Protection, and Insurance" and with previously introduced House and Senate bills because we believed that the Government must assume some of the risk involved in the operation of atomic power reactors, and that such reactor plants must not face an insurance premium cost which will make such operations infeasible.

As in the past, the National Rural Electric Cooperative Association at their annual meeting, in March 1957 endorsed a resolution concerning the need for insurance protection from atomic energy (copy attached). This resolution States that the National Rural Electric Cooperative Association is in favor of Federal insurance legislation that will protect the entire electric utility industry against "catastrophic limits beyond which insurance carriers cannot insure at a reasonable premium." Further, the resolution recommends that the Federal Government provide for steps to be taken to assure that insurance costs be kept within limits that will not discriminate against consumer-owned electric utilities by making their projects infeasible.

In view of the fact that the wording of H. R. 1981 as introduced in the House of Representatives by Congressman Price on January 5, 1957, and S. 715 as introduced in the Senate of the United States by Senator Anderson on January 17, 1957, is identical, my comments will refer to both bills.

We certainly agree with the wording of section 170, "Indemnification and limitation of liability," paragraph (b), which states in part that the amount of

financial protection required shall not exceed the amount of liability insurance available from private sources since this section takes into consideration:

1. The cost in terms of private insurance;
2. The type, size and location of licensed activity and other factors pertaining to hazard; and
3. The nature and purpose of the licensed activity.

We also approve paragraph (c) which agrees to indemnify and hold harmless the licensee and other persons indemnified from public liability, arising from nuclear incidents, which is in excess of the amount of financial protection required in amount of $500 million in aggregate for all persons indemnified in connection with each nuclear incident. We feel that this is certainly an improvement on the previous limitation to "twice the capital cost of the reactor".

We also agree with the intent of paragraph (e) which grants the Commission or any person indemnified the right to apply to the appropriate district court of the United States upon a showing that public liability from a single nuclear incident will probably exceed the limit of liability imposed by this section. This entitles the Commission or persons involved to such orders as may be appropriate for the enforcement of the provisions of this section, including an order limiting the liability of the persons indemnified, orders staying the payment of claims and the execution of court judgments, orders apportioning the payments to be made to claimants, orders permitting payments to be made before final determination of the total claims, and an order setting aside a part of the funds available for possible latent injuries not discovered until a later time.

We look with favor upon paragraph (f) which states that facilities licensed under section 104, and for construction permits under section 185, the Commission is authorized to reduce the fee of $30 per year per thousand kilowatts of thermal energy capacity charged for facilities licensed under section 103. Since this section does take into consideration such factors as:

1. Type, size and location of facility involved, and other factors pertaining to hazard; and
2. The nature and purpose of the facility;

we feel that the rural electric systems will not face a prohibitive insurance premium cost for the required protection.

I would now like to make some general comments on H. R. 1981 and S. 715, and some specific comments on the possibility that could arise which would eliminate the rural electric cooperatives from participation in the atomic energy program either through denying them adequate insurance protection or offering them insurance at rates which would be prohibitive.

First, let me say that we agree with the tacit assumption being made by everyone concerned with this problem that a Government insurance program appears to be a necessity if any nuclear powerplants are to be constructed.

Second, I believe that we should not overlook the possibility of approaching this insurance problem another way. As several people suggested in testifying before your committee last year, and as Mr. Gail L. Freer, personnel and insurance director of the Rural Cooperative Power Association, said in testifying before your committee this week, we might entertain the idea that the Federal Government assume the entire nuclear accident risk on private projects during some initial period, until adequate experience could be gained. When this time is reached, the insurance industry could take over the entire job of insuring against nuclear accidents, at rates which would not be prohibitive.

Such an approach as we suggest above seems to be the most straightforward solution.

We have some reservations, too, concerning the increase in power the Atomic Energy Commission would have added to its already enormous powers. Under this legislation the AEC will have the authority to tell each licensee how much private insurance he must carry, subject only to some nebulous criteria. I understand that the AEC has already proposed an amendment to S. 715 which would eliminate from section 170 (b) the cost and terms of private insurance as one of the criteria to be considered by the Commission in establishing the amount of private insurance to be carried by a licensee.

If the approach outlined in S. 715 is adopted to solve the liability insurance problem, we would strongly oppose this AEC amendment, for the reasons that private insurance costs are a very important factor in determining the economic feasibility of small- and intermediate-size nuclear powerplants being contemplated by consumer-owned electric utilities which do not operate as do the privately owned utilities—on a cost-plus basis.

We also have some reservations on the way in which the insurance industry is banding together to finance the cost and spread the risks of insuring for nuclear incidents. Two insurance pools have been set up, the Nuclear Energy Liability Insurance Association, and the Nuclear Energy Property Insurance Association. As you know the insurance industry is already highly concentrated with the 50 largest insurance corporations accounting for 81 percent of all insurance company assets. We feel assured that these two insurance pools contain all the big insurance companies in the country. With these 2 pools serving as the only source of nuclear incidents insurance, the licensee will be forced to buy as much insurance as the AEC requires from private sources, 1 of the 2 pools, at whatever rates the syndicate demands. This seems to leave much to be desired if we wish to maintain any semblance of competition in this industry.

We already have evidences of the monopolistic leanings of these pools. As Mr. Freer pointed out in his testimony the Rural Cooperative Power Association at Elk River, Minn., has had premium quotations from insurance carriers (the two pools) which are prohibitive. This cooperative has also been advised that members of the pool require that the boiler and machinery coverage of their plant, which might be held by another company, would have to be transferred to the pool insurance company member. The pools, we have been told are offering blanket insurance policies. To us this means that you must take all your insurance from the pool, or else you will not be insured for nuclear incidents.

Such dealings smack of anything but competition. Further, it is not hard for us to envision a move on the part of the private utilities, which hold large blocks of private insurance company securities, to force the insurance companies to charge rates to the consumer-owned utilities which would be prohibitive, and thereby, eliminate all competitive elements from the electric utility industry.

A move seems to be on by the private insurance companies, as was evident in Mr. Kelly's testimony for the Factory Mutual Companies to amend S. 715 so that the Federal indemnity program would also be liable for property damage. This amendment would provide that the property of the reactor owner or operator, which is damaged as the result of an incident at a licensed facility and for which he is not legally liable, would be included within the protection of the Federal indemnity program. It appears to us that the private insurance companies in this instance want the Federal Government, the people, to assume the risk for all liability which may result from a nuclear incident, and the private insurance companies will assume the risk for a relatively small portion of the entire liability which may arise from a nuclear incident. If this is to be the case, then it becomes apparent that all the private insurance companies want is the right to collect the premiums, but they do not want to assume the risk of paying any of the freight.

If such a proposal is seriously considered, and if added as an amendment to this proposed legislation we are forced into the position, since it will be the Federal Government only which will assume all liability, to support a complete Federal nuclear indemnity insurance bill.

Finally, I would like to say that we must all recognize the fact that Federal indemnity coverage is a subsidy to private industry. This fact must always be kept in mind so that at no time in the future will we run the risk of having this subsidy continue indefinitely.

We have assumed that the committee, in its considered opinion, wishes to take the approach outlined in S. 715 and H. R. 1981 in order to solve the nuclear insurance indemnity problem. Since the solution of this problem is necessary to provide for an acceleration of the atomic energy program in this country, we appear in behalf of this proposed legislation. However, we have made two other assumptions concerning this proposed legislation: (1) We have assumed that the provisions of this proposed legislation will be properly administered; and (2) we have assumed that the rural electric cooperatives will be able to secure adequate insurance coverage at a cost which will continue the feasibility of their projects, but will still indemnify the general public in amounts that will realistically satisfy their claims. If, in the future, it appears that these two assumptions are not valid, we will appeal to the Congress for legislation which will make possible participation of the rural electric cooperatives in the atomic energy program.

NRECA ANNUAL MEETING, 1957

From: Insurance and employee welfare committee.
Approved by: Resolutions committee.
Subject: Insurance protection from atomic energy.

Whereas it is of the utmost importance to our member systems to see that our rural electric generating and transmission systems have adequate insurance protection; and

Whereas atomic energy and reactor power will in the future be used by more and more of our rural electric cooperatives; and

Whereas the cost of insurance to protect the public and the employees against the catastrophic damage possibilities is prohibitive; and

Whereas it is the utmost importance to have adequate public liability and property damage insurance: Now, therefore, be it

Resolved, That National Rural Electric Cooperative Association express to Congress the need for insurance legislation that will protect not only our rural electric cooperatives, but industry as a whole, against the catastrophic limits beyond which insurance carriers cannot insure at a reasonable premium; and be it further

Resolved, That we request the Congress to establish legislation which will enable the Government to assure the unusual insurance limits brought about by reactor power and that insurance costs be kept within limits that will not make the projects infeasible.

PENNSYLVANIA POWER & LIGHT CO.,
Allentown, Pa., March 21, 1957.

Subject: Indemnity legislation, S. 715 and H. R. 1981.

Hon. CARL T. DURHAM,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States, Washington, D. C.

DEAR MR. DURHAM: During the indemnity hearings held last year we took the position in testimony before the joint committee that the Anderson (S. 4112) was sound and desirable legislation. With the passage of another year, there is even greater reason for the enactment of this type of law. We, therefore, urge that the committee report favorably on the current bills, S. 715 and H. R. 1981.

We do consider it to be most important that there be a proper dovetailing of the Federal legislation and the coverage recently announced as available by private insurance company groups. It would seem likely that if gaps should exist in the combined Government and private coverage, the desired objectives of the currently proposed legislation would not be fully achieved.

Very truly yours,

CHAS E. OAKES, *President.*

THE PENNSYLVANIA STATE UNIVERSITY,
University Park, Pa., March 23, 1957.

Hon. CARL T. DURHAM,
Chairman, Joint Committee on Atomic Energy,
The House of Representatives, Washington, D. C.

DEAR CONGRESSMAN DURHAM: I have your letter of March 12 asking if we have had any changes in our position in regard to private insurance for third-party liability arising out of reactor risks.

As you know, we have a reactor and have been watching rather closely the developments of insurance for this purpose, and have asked our insurance brokers to keep us informed and let us know of the rates when the companies arrive at a position where such insurance can be offered. On March 20, 1957, we were told that at least one company, or a group of companies, is prepared to offer temporary coverage at the following tentative rates:

For the first million: $6,250 per year
For the next four million: $2,250 per million per year
For the next five million: $1,050 per million per year

Before such insurance will be issued, the company wishes to arrange for an inspection of the reactor installation and then will make us a firm offer for third-party liability and property damage insurance.

This is as far as we have gotten.

Very truly yours,

ERIC A. WALKER, *President.*

POWER REACTOR DEVELOPMENT CO.,
Detroit, Mich., April 2, 1957.

Hon. CARL T. DURHAM,
Chairman, Joint Committee on Atomic Energy,
Washington, D. C.

DEAR CHAIRMAN DURHAM: We sincerely appreciate your invitation to express our views in regard to legislation which has been proposed providing for governmental indemnity against reactor hazards.

We have examined Senate bill S. 715 and House bill H. R. 1981, which have been referred to your committee, and believe that such legislation would be in the public interest and would be an important factor in accelerating the peacetime application of atomic energy. In our opinion, these bills incorporate the basic factors which I outlined in my May 16, 1956, statement before your committee, and they provide sufficient authority to the Atomic Energy Commission to enable the Commission to integrate the protection furnished with that presently contemplated by private insurers.

We earnestly advocate the enactment of this legislation as an important step in furthering the peaceful utilization of nuclear energy.

With best wishes,

Sincerely,

WALKER L. CISLER, *President.*

STEEL PLATE FABRICATORS ASSOCIATION,
Chicago, Ill., March 25, 1957.

Re insurance and indemnity protection for suppliers of materials and equipment for atomic-energy projects.

Hon. CARL T. DURHAM,
Chairman, Joint Committee on Atomic Energy,
Congress of the United States,
Washington, D. C.

DEAR SIR: The Steel Plate Fabricators Association, composed of 55 firms[1] engaged in custom building of heavy metal plate structures has sought to represent that industry for over 24 years. It has a vital interest in H. R. 1981, and because of its interest in such legislation desires to make this statement which it hopes will be given serious consideration by your committee and by the Congress.

Members of the Steel Plate Fabricators Association are the natural suppliers of heavy metal plate components such as primary reactor shield tanks, reactor containment vessels, heat exchangers, boilers, pressure vessels, storage and process tanks, large diameter pipes, entrance locks and the like for large atomic facilities. They have much valuable experience in the design, engineering, fabrication and field erection of metal-plate structures for many industries, including the petroleum, chemical, power and water supply industries, and their engineers are trained and experienced in the conservative design of such structures. They have been among the leaders in designing from basic design criteria furnished by other scientists and engineers having expert knowledge in the atomic field suitable structures of heavy metal plate construction for use in atomic facilities and particularly large nuclear reasearch and power reactors.

The doctrine that a manufacturer may be held liable to persons other than his customer for a defect in a manufactured product was held to be applicable to the products of steel plate fabricators in two cases which arose out of the collapse of a tank designed and built to hold liquefied methane gas at low temperature under pressure, in which more than a hundred persons were either fatally injured or grievously burned in the fire which followed the collapse. The case of *Foley* v. *Pittsburgh Des Moines Co.*, 363 Pa. 1, 68 Atl. 2d 517, was decided by the Supreme Court of Pennsylvania. The case of *Moran* v. *Pittsburgh Des Moines Co.*, arose in the Federal courts and the decision of the United States Court of Appeals for the Second Circuit was reported in 166 F. 2d 908. The United Staes Supreme Court denied certiorari, 734 U. S. 846. Both cases held that, where fault might be traced to the manufacturer of the tank, the manufacturer could be held liable to persons who might be injured through failure of the structure. These cases have emphasized to

[1] A membership list is attached to this letter.

members of the heavy metal plate fabricating industry their great responsibilities to the public in designing and building safe structures.

It would be difficult, if not impossible, to determine the cause of failure of a metal plate structure in a nuclear accident. Furthermore, in this new field of atomic power, it would be equally difficult to determine whether the design criteria furnished to the fabricator were adequate. Finally, the natural tendency of juries to favor an innocent injured plaintiff over a manufacturer might, in a lawsuit arising out of a nuclear accident, cause a jury to fail to give proper attention to the requirements of proof of wrong on the part of the defendant.

Potential liability for atomic accidents might greatly exceed the $65 million which we understand has been made available by private stock and mutual insurance company pools. The entire assets of a metal plate fabricator might be seized to satisfy judgments against it. Fabricators are unwilling, therefore, to undertake contracts in this field without being relieved of uninsurable liability in some way.

We strongly urge that legislation be reported by your committee and enacted by the Congress authorizing the Federal Government to indemnify owners and operators of atomic facilities, and their suppliers, against losses in excess of those for which private insurance is available. If there is to be an upper limit for such indemnification, then the liability of such owners, operators, and suppliers should be limited in some manner.

We feel that H. R. 1981 is designed to accomplish these objectives, and we therefore strongly recommend that it be enacted into law. Failure promptly to enact such legislation will, we believe, result in the delay or abandonment of all major private peacetime atomic projects in this country.

Very truly yours,

STEEL PLATE FABRICATORS ASSOCIATION,
By E. E. MICHAELS, *President.*

MEMBERSHIP

American Bridge division, United States Steel Corp., Pittsburgh, Pa.
The Babcock & Wilcox Co., New York, N. Y.
Beall Pipe & Tank Corp., Portland, Oreg.
Bethlehem Steel Co., Bethlehem, Pa.
Birmingham Tank Co. division, Ingalls Iron Works, Birmingham, Ala.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Miles P. Brown Boiler Works, Franklin, Pa.
W. E. Caldwell Co., Louisville, Ky.
Chattanooga Boiler & Tank Co., Chattanooga, Tenn.
Chicago Bridge & Iron Co., Chicago, Ill.
Chicago Steel Tank Co., division United States Industries, Chicago, Ill.
R. D. Cole Manufacturing Co., Newman, Ga.
Combustion Engineering, Inc., New York, N. Y.
Consolidated Western Steel division, United States Steel Corp., Los Angeles, Calif.
The Darby Corp., Kansas City, Kans.
Delta Tank Manufacturing Co., Inc., Baton Rouge, La.
Downingtown Iron Works, Inc., division Pressed Steel Tank Co., Downingtown, Pa.
Dresser Manufacturing division, Bradford, Pa.
Electroweld Manufacturing Corp., Erie, Pa.
J. J. Finnigan Co., Inc., Atlanta, Ga.
Flint Steel Corp., Tulsa, Okla.
General American Transportation Corp., Chicago, Ill.
Graver Tank & Manufacturing Co., Inc., East Chicago, Ind.
Hammond Iron Works, Warren, Pa.
Hibben & Co., Chicago, Ill.
Hydraulic Supply Manufacturing Co., Seattle, Wash.
Kaiser Steel Corp., fabricating division, Napa, Calif.
Kansas City Structural Steel Co., Kansas City, Kans.
Koven Fabricators, Inc., Dover, N. J.
Lackawanna Steel Construction Co., Buffalo, N. Y.
The Lang Co., Inc., Salt Lake City, Utah
Morgan Steel Products, Inc., Cleveland, Ohio

National Annealing Box Co., Washington, Pa.
National Tank & Manufacturing Co., Los Angeles, Calif.
Nazareth Steel Fabricators, Inc., Nazareth, Pa.
Nooter Corp., St. Louis, Mo.
Omaha Steel Works, Omaha, Nebr.
Pacific Coast Engineering Co., Alameda, Calif.
Paul Simon Boiler & Welding Co., Cleveland, Ohio
Pennsylvania Enginering Corp., New Castle, Pa.
Pittsburgh Des Moines Steel Co., Pittsburgh, Pa.
The Wm. B. Pollock Co., Youngstown, Ohio
Puget Sound Fabricators, Inc., Seattle, Wash.
Richmond Engineering Co., Inc., Richmond, Va.
Southwest Welding & Manufacturing Co., Alahambra, Calif.
The Stacey Manufacturing Co., Cincinnati, Ohio
The Stearns-Rogers Manufacturing Co., Denver, Colo.
Steel and Alloy Tank Co., Newark, N. J.
Struthers Wells Corp., Litusville, Pa.
Terre Haute Boiler Works Co., Inc., Terre Haute, Ind.
Treadwell Construction Co., Midland, Pa.
Union Boiler & Manufacturing Co., Lebanon, Pa.
Wheelerweld Division, C. H. Wheeler Manufacturing Co., Ambler, Pa.
Wyatt Metal and Boiler Works, Houston, Tex.
Youngstown Steel Tank Co., Youngstown, Ohio

STATEMENT FOR THE RECORD, BY CHARLES H. WEAVER, VICE PRESIDENT, WESTINGHOUSE ELECTRIC CORP.

In connection with your hearings on proposed legislation providing for governmental indemnity, I submit the following comments for the record.

The legislation before you is of the utmost importance to assure continuation of atomic power development to this country. I assume that you will receive supporting statements from prospective operators of nuclear powerplants. As a manufacturer of equipmemnt for both private and Government use, my company's activities in this field are equally dependent on the outcome of this legislation.

I have advised you in previous hearings of the scope of my company's activities in the atomic energy field. We began reactor development work some 9 years ago, have substantial programs for naval application with which you are familiar, and also civilian power projects under way to provide nuclear facilities for operation by several utilities or groups of utilities. These programs have borne fruit most dramatically in the *Nautilus* and in the Shippingport reactor scheduled for operation late this year.

Since the 1950 act, my company has invested substantial funds in atomic energy activities. We have established a number of Westinghouse-sponsored activities apart from the Government-sponsored facilities at our Bettis Atomic Power Division. We have become not only a supplier of atomic electric plants, but a supplier of components and a fuel element fabricator. We expect to be an operator of a testing reactor. We will be supplying nuclear equipment for military and other governmental use and for private customers. We will be handling special nuclear material at a number of our activities at varying locations.

Many of these activities may expose us to a risk which is out of proportion to both our investment and to the volume of business against which the cost of the risk can be assessed.

In the area of indemnity our problems generally fall into three classes: Our domestic commercial activity, our Government activity, and our foreign activity.

1. *Domestic commercial activity.*—During the past 2 years, the insurance and indemnity problems have come into clearer focus. The Atomic Industrial Forum through the Columbia study and a number of symposiums, together with the hearings held by your committee, and the efforts of the insurance industry, have assisted in this respect. We are not as yet sure of our position insurancewise. The forms of insurance policies recently made available are under study. The cost of available insurance and its application to our particular needs is still being explored. Without dwelling on the insurance protection, however, it seems apparent to all concerned that whatever the adequacy of insurance

within the available limits, it will not be adequate in amount to assure that our customers will place nuclear plants into operation. We have, nevertheless, continued our work with the liability problem unsolved although it has caused difficulties in dealing with suppliers and delays in contract negotiations. We are rapidly being faced with the ultimate decision as to whether these plants will go critical. Without legislation it seems to be indicated that they will not.

In general, I feel that the concept developed by the committee last year is excellent in terms of civilian projects. If it is acceptable to the operators of nuclear powerplants, it is acceptable to my company. The committee has certainly done a careful job.

I urge the committee's continued recognition of the pressing importance of legislation.

2. *Government activity.*—In connection with our Government business some further assistance is needed either through this or other legislation. Of the bills before you S. 715 is preferable in this respect to S. 52, as H. R. 1981 is to H. R. 888.

The legislation before you, however, does not purport to cover defense contracts except to the extent that the Commission is the contractor. I understand that additional legislation to authorize indemnity agreements has been under consideration with the Defense Department since early last summer but no bill has as yet been introduced in the Congress. Legislation to cover Defense Department activity is needed.

The Commission, and to some extent the Defense Department, have been generally sympathetic to indemnity for prime contractors in research and development work where something new is being attempted. But even in this field prime contractors have not been authorized to extend such indemnity to subcontractors and suppliers despite their repeated and legitimate requests for such protection. There has been less recognition given to the problem when work has proceeded beyond the research and development stage, particularly as we move toward the day when we or our suppliers can work more on normal fixed price contracting. We have a growing concern in the product and public liability field as we pass from research into production of duplicate or nearly duplicate systems for Government use. If there is an exposure to liability on our part, or to loss by the public, from the operation of a single nuclear powerplant, the exposure is multiplied as more and more plants come into active use.

Pending legislation, my company has gone ahead with every project despite the lack of protection and many of our suppliers have also been willing to go along in the hope or expectation that legislation would cover work presently in process. As we have been proceeding in good faith, we feel that any authorization in this legislation should be made retroactive to cover projects previously started.

The Government has been reluctant to exercise such authority as may presently exist while such legislation is pending and while your committee is deliberating the extent to which governmental indemnity should go. This reluctance has frequently been expressed by "Let's wait and see what the Congress will do." We, therefore, hope not only for a clear grant of indemnity authority, but for an endorsement by the committee of its fullest use. Also, we would like to have authority granted not only to the Commission but to the military departments. These departments play a greater role as we reach the production stage where our exposure is multiplied simply by the increase in number of reactors operated by these departments. This is particularly true with respect to components furnished by us and our suppliers.

3. *Foreign activity.*—I mentioned this additional problem to the committee in last year's hearings. The problem relates to protection against third party liability on our exports of nuclear equipment. I realize that this is perhaps not a subject for this legislation. This protection is, however, as acute a problem in the foreign field as in the domestic. Although there may be other ways to assist American suppliers in gaining protection, the most immediate solution seems to be through the bilateral agreements. Mr. Cole has made such a proposal in H. R. 5694. Following last year's hearings, I corresponded with Senator Pastore on this subject and I understand he brought the matter to the attention of the Commission. Westinghouse personnel have discussed the matter with the Commission staff at various times during the past year.

Whether through the device of Mr. Cole's proposal or simply by negotiation, it would certainly be helpful if bilateral agreements required the foreign country to indemnify American suppliers. After all, if through your legislation, indemnity is afforded by our Government to cover any incident occurring in

this country and runs in favor of foreign suppliers, it seems only reasonable to ask foreign countries to cover incidents occurring abroad and to protect American suppliers. Further, the average American supplier cannot be expected to know and to keep up with the laws of all foreign countries as to his liability. It is reasonable to expect the foreign country to extend an indemnity. Certainly it is in the interest of our Government to further the efforts of American suppliers in support of the atoms for peace program.

The committee's support for this position would be appreciated and would carry weight in the negotiation of a protective provision in bilateral agreements.

In concluding, it is my belief that the insurance and indemnity issues arise from the complexity of the technical and scientific problems which face us. I hope that they will diminish in importance when the state of the art has considerably advanced. Although ultimately we hope to resume more normal commercial patterns, it appears that for the present legislation and Government indemnity is necessary.

YANKEE ATOMIC ELECTRIC CO.,
Boston, Mass., March 25, 1957.

JOINT COMMITTEE ON ATOMIC ENERGY,
Senate Post Office, Washington, D. C.

DEAR SIRS: This is in reply to your memorandum No. 75 dated March 12, 1957, regarding public hearings on proposed legislation providing for governmental indemnity against reactor hazards. In accordance with the policy suggested in your memorandum, we submit this statement for the record.

The indemnity problem has been a matter of major concern to us from the outset and we consider the prompt adoption of a Federal law on this subject most important. We consider the proposal in the pending Anderson bill (S. 715) an appropriate means of providing the necessary additional protection and feel we can go forward with our project under such an amendment to the Atomic Energy Act. Our reasons and comments were set forth in a statement dated May 11, 1956, by the undersigned, William Webster, president of Yankee Atomic Electric Co., presented to your committee on May 18, 1956.

Yours very truly,

WILLIAM WEBSTER, *President.*

The CHAIRMAN. This completes the hearing on insurance at this time. We may have to reopen them at a later date.

Thank you very much. The committee is adjourned.

(Thereupon, at 3:45 p. m., Wednesday, March 27, 1957, the committee was adjourned.)

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